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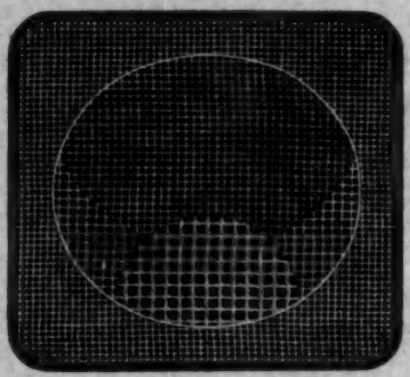

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DERMOID TUMOR AT LIMBUS WITH SCLERAL ECTASIA.
(CALHOUN'S CASE.)

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Vol. 7 SEPTEMBER, 1924 No. 9

A DERMOID TUMOR OF THE CORNEO-CONJUNCTIVA ASSOCIATED WITH SCLERAL ECTASIA.

F. PHINIZY CALHOUN, M. D.,

ATLANTA, GA.

This is the report of a case in which a dermoid, situated at the corneoscleral junction was associated with congenital ectasia of the sclera. In removing the dermoid the sclera was opened but the result was excellent. The case supports the dermal inclusion theory of such tumors.

Socalled dermoid tumors arising from the conjunctiva and situated astride the limbus are not rare, and mention is frequently made of their association with congenital formations about the lids and face.

This type of dermoid associated with a congenital ectasia of the sclera is, so far as I am aware, unrecorded.

E. B., age 17 years, a perfectly healthy girl of normal parentage, was first seen in infancy, when the mother stated that the "mark and bulging" of the eye had been present since the birth. I advised against an operation at that time. The mother now thought that neither the growth nor swelling had increased, but that the eye had become irritable from the growth of three small hairs which she kept plucked from the tumor. The left eye was normal in every detail.

The right eye had vision of hand movements. The motility was good. On the cornea, between IV and VI o'clock astride the limbus, was a yellowish-white elevation, measuring 7 mm. in diameter and possibly 2 mm. thick, which was fairly soft, in that it pitted on pressure. The surface was slightly uneven and in the center there were three small cilia.

There was a faint semilunar opacity surrounding the corneal portion of the tumor. The cornea was otherwise normal.

At a distance of 2 to 3 mm. from the conjunctival edge of the tumor, situated on the globe between the internal and inferior recti muscles, there was a soft subconjunctival swelling of a light bluish color. The upper part was slightly movable, while the lower part was firm and evidently a part of the sclera. This tumor lay beneath the lower lid, and extended further back than could be seen even when the lower lid was retracted and the globe rotated upward and outward.

The iris was brown, and the pupil was round, centrally placed and reacted to the usual stimuli. The fundus details were normal except that thru a dilated pupil, looking far forward in the region of the scleral ectasia, could be seen a black cavity with sharp edges. The tension was normal.

The tumor was removed from the cornea and conjunctiva by a simple dissection, only leaving a faint corneal opacity. The conjunctiva was undermined and covered the raw surface of the sclera. In this dissection the sharp point of the scissors accidently punctured the upper limits of the movable portion of the swelling, with the presentation of a bead of vitreous, thus proving that the sclera was ectatic.

The end result was excellent, with a decided improvement in the ocular disfigurement.

The examination of the tumor was uninteresting, in that there was only an external layer of laminated squamous epithelium which covered a dense stroma of connective tissue. The section examined showed no hair follicles or glands.

That the dermoid tumor and the scleral ectasia were congenital is certain. As to the origin of the dermoid, the theory of dermal inclusion as propounded by Verneuil seems most logical. It states that the dermoid arises from the inclusion of a pouch of skin which is invaginated into the deep tissues during fetal

life. Parsons thinks that this theory is strongly supported by the site of election of these tumors, which are situated at or near the sites of fetal sutures or clefts.

The scleral ectasia is explained by our understanding of the formation of a coloboma, which is located in the fetal ocular cleft.

The layers of the secondary vesicle, which grow towards each other and do not close as in a coloboma, become filled with mesodermal tissue. This tissue is not yet differentiated into choroid or sclera at the time the fissure should close; and fibrous tissue develops from this plug, which becomes ectatic on account of the intraocular pressure. The formation of cysts lined with retina and which are directly connected with microphthalmic eyes, is even a step further in this embryologic change.

Is there then not some embryologic reason and not a mere coincidence for the association of this dermoid tumor and scleral ectasia? If so, Verneuil's theory is further substantiated.

TUBERCULOSIS OF THE CORNEA-SCLERA.

C. H. Chou, M. D.,

CHANGSHA, CHINA.

This is the report of a case including its clinical features and the microscopic examination of the excised eye. Different lesions showed different stages of development. Those apparently oldest were situated in the sclera. The studies were made in the Department of Ophthalmology of the Peking Union Medical College, Peking, China.

Tuberculosis of the cornea is not a primary disease. Parsons[1] believes that it is invariably secondary to an involvement of the ligamentum pectinatum. Treacher Collins[2] believes also that the uveal tract is the primary seat of the disease, and that the lesions in the cornea are usually secondary.

Verhoeff[3], on the other hand, explained a case of tuberculous scleritis and keratitis as the result of an infection of the aqueous humor. The infection of the latter was said to have been derived from the superficial capillaries of the ciliary body. He believes that bacilli "might readily pass thru the intact pars ciliaris retinae, when carried in leucocytes and endothelial cells," and maintains that old foci or scars need not necessarily be found on the surface of the ciliary body for such a mode of infection, as they may be healed and not recognizable. By the current in the aqueous, the tubercle bacilli are carried into the filtration angle, which subsequently becomes infected. From here the disease may spread into the sclera and cornea.

Verhoeff[4] proves his belief by his subsequent experiments on rabbits, in which he succeeded in producing tuberculous lesions in the cornea and sclera, by injecting dead bacilli into either the anterior chamber or the vitreous cavity.

The report of the following case with histologic findings also proves that tuberculous scleritis and keratitis are not necessarily due to an extension from any focus in the uvea. It is more or less similar to Verhoeff's case, but the primary focus was probably in the sclera.

CASE REPORT.

Case No. 4428. C. C. S., a girl of sixteen, was admitted to the Peking Union Medical College Hospital on March 5, 1923.

Present Illness: Patient complained of impairment of vision of the right eye for five months. The disease began with acute inflammation of both eyes which lasted for about a week. After the subsidence of the inflammation the vision of the right eye became very poor, but that of the left was unaffected. Patient is in good health, and there is no history of tuberculosis. Family history is negative for tuberculosis.

General physical examination reveals nothing abnormal. Spinal fluid and blood Wassermann negative. Intradermal injection of O. T. on the sixth

of March gave a strongly positive reaction. V. R. 1/21. V. L. 6/5. Tension R.=10 mm. L.=25 mm. (McLean.)

Local examination: There is slight ptosis of the right upper lid, also a moderate conjunctival and ciliary injection. Cornea is rather clear, except that there are two or three whitish patches of exudate on the posterior surface of the lower third of the cornea. Pupil is irregular and slightly oval; its margin heavily pigmented. It does not react. The surface of the iris is muddy in appearance. The lens is covered by numerous pigmented deposits, and shows some streaks of opacities. The left eye is normal. A diagnosis of chronic iridocyclitis was made, probably tubercular in origin, and the eye was enucleated on March 9, 1923.

On November 10, 1923, the patient was asked to return for another examination. The X-ray suggested an active pulmonary tuberculosis of the left apex, and along the left vertebral stem bronchus.

PATHOLOGIC EXAMINATION.

Macroscopic Examination: The eyeball is fixed in Müller's fluid. The specimen consists of a fairly round eyeball, measuring antero-posteriorly 23 mm., horizontally 23 mm., and vertically 23.5 mm. It is cut vertically thru the antero-posterior diameter into halves. No fluid escapes. The anterior chamber measures 2 mm. deep at the pupillary area and 1 mm. at the periphery. It is filled with a small amount of greenish yellow coagulum. The iris is in situ. No evidence of synechiae, pupil is slightly irregular. Some deposits of fibrin between the vitreous body and the ciliary processes, otherwise no gross changes can be seen. Vertical serial sections were made and stained with hematoxylin-eosin, van Gieson, and some with Verhoeff's stain for tubercle bacilli.

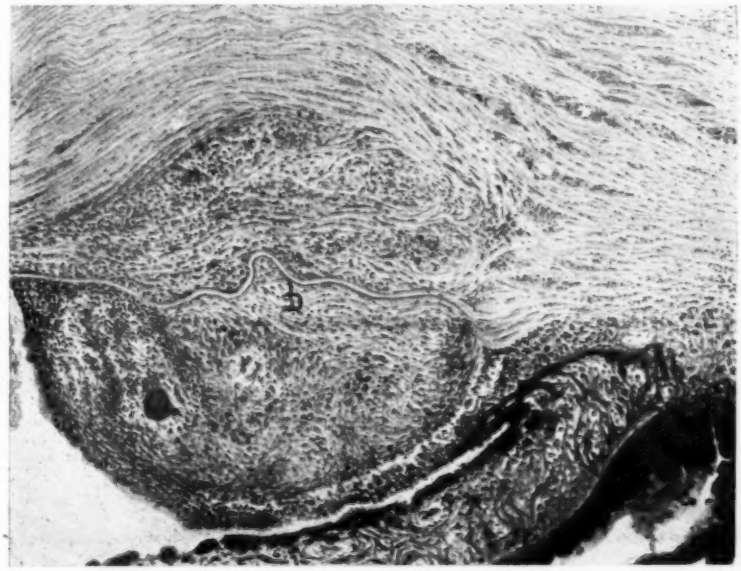

Fig. 1.—Deep tuberculous keratitis x 58. Numerous nodules in front and behind Descemet's membrane, the wavy line D. The filtration angle is obliterated and iris pushed back by nodule.

Microscopic Examination Cornea. The corneal epithelium is slightly uneven, the foot-cells are somewhat shrunken and distorted. Occasionally a few lymphocytes are found in the epithelium. The superficial layers are normal. A small superficial scar near the center replaces Bowman's membrane, otherwise the membrane is everywhere intact. The corneal stroma near the limbus, where the active foci are absent, contains a moderate de-

gree of leucocytic infiltration. In its deeper layers, it is markedly traversed by numerous newformed blood vessels.

In the lower periphery of the cornea, immediately in front of Descemet's membrane, there is a nodule (Fig. 1) about 1 mm. by 0.5 mm. It extends upward almost in an annular fashion. Its size gradually decreases from below upward. Below, it pushes the corneal stroma forward; above, it merely infiltrates between the corneal lamellae, forming a sort of septum, which divides the growth into numerous minute nodules. These little nodules as well as the main nodule are composed chiefly of epithelioid cells with irregular nuclei. The cytoplasm is pinkish and poorly stained. In places it forms a kind of syncytium. Not infrequently one or more Langhans' giant cells are found near the center of the nodules, but there is no distinct central necrosis or caseation. The center of some of the nodules is slightly stained with van Gieson's stain. Most of the nodules possess a distinct peripheral zone of lymphocytes which stain well with hematoxylin.

Behind Descemet's membrane and posterior to the main corneal nodule is another irregularly oval nodule, quite similar to the main nodule. Near its center there is a large giant cell. This nodule fills up nearly the entire filtration angle, and in some sections it is in direct contact with the surface of the iris root. The end of Descemet's membrane here lies between the two nodules as a wavy line (Fig. 1). Both these nodules are practically of about the same size, structure, and age, but the main corneal nodule contains more collagen than the other and is perhaps slightly older.

A little below the center of the cornea, a large vertically situated fusiform nodule is found, in which there are one or two giant cells (Fig. 2). This nodule is connected with the main nodule below by means of a long narrow strip of inflammatory tissue. Behind this nodule Descemet's membrane is partially destroyed. The corneal lamellae in front of the nodule are merely pushed forward and not destroyed. From the narrow strip of inflammatory tissue, below this fusiform nodule, a long strand of tuberculous exudate protrudes into the anterior chamber. Where the strand of exudate arises, Descemet's membrane is recognized with difficulty.

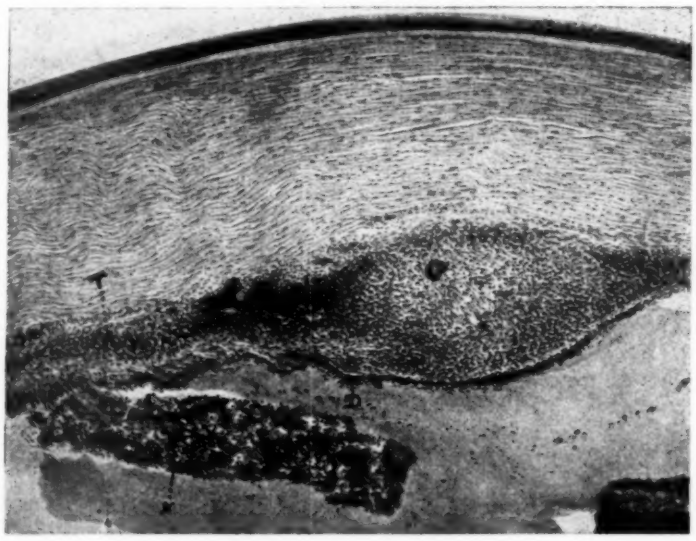

Fig. 2.—Deep central keratitis, x 48. A large nodule with giant cell pushes Descemet's membrane, D, backward; the latter being mostly destroyed over the focus. T, tuberculous inflammatory tissue in deeper layers of cornea. X strand of exudate with numerous giant cells.

On the surface of the endothelium there are numerous aggregations of cells; they are probably areas of proliferated endothelium. Many of them are free in the anterior chamber. The whitish corneal patches recognized clinically were undoubtedly due to these corneal nodules and the strip of inflammatory tissue between them.

Ligamentum Pectinatum: This structure is everywhere extensively involved. The spaces of Fontana and the canal of Schlemm are markedly infiltrated with epithelioid cells and lymphocytes. At the lower quadrants of the eye, this infiltration is more extensive, and is frequently directly connected with the corneal nodules.

Sclera and Episclera: Anterior to the ora serrata, especially in the vicinity of the corneoscleral junction, the sclera is very vascular. The number and size of the blood vessels are greatly increased. In addition, the entire anterior segment of the sclera is invaded by numerous nodules of epithelioid cells and lymphocytes of different sizes (Fig. 3). In the deeper strata a few of them are as large as the nodules found in the cornea. In one of the sections, one of these nodules is found at the equator. In another section, a nodule is seen behind the equator. Both of these nodules have involved the deeper layers of the sclera, but they are distinctly separated from the choroid. The larger scleral foci are found, as a rule, in the vicinity of the ora serrata. They show slight caseation. Some of them are either in the process of healing or healed, as shown by the van Gieson stain. These scleral nodules are undoubtedly the most advanced in development.

Thru the scleral spur, the nodules in the innermost layers of the sclera have extended into the ciliary body. Some of them are of a fairly large size. They project into the suprachoroidal space; some of them are seen lying within the trabeculae of the suprachoroidea. These nodules tend to push the ciliary muscle inward, but do not seem to involve its fibers. The marked involvement of the innermost layers of the sclera certainly justifies the name scleritis interna (Fig. 4).

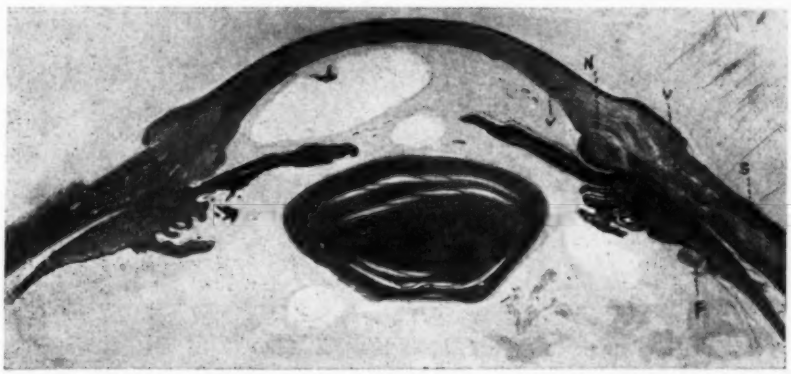

Fig. 3.—Tuberculous keratoscleritis, x 6. N, nodule in cornea; S, nodule in sclera; V, marked vascularization of sclera and deeper layers of cornea; F, focus in pars plana, breaking thru pigment epithelium.

The episclera is also markedly involved. In certain places, there are nodular infiltrations of epithelioid cells and lymphocytes. Some of them seem to have almost healed, as various stages of development of fibroblasts are present. The largest episcleral nodule is found on the upper part of the eyeball, about 4 mm. behind the limbus (Fig. 5). It measures about 1 mm. by 0.5 mm. It is traversed by numerous strands of connective tissue, and is covered externally by numerous lymphocytes.

Iris: The iris is not much affected except its root, in the lower segment of the bulbus. The involvement of the iris here is due to a direct extension from the lesions in the sclera and

the ciliary body. The periphery of the iris is adherent to the ligamentum pectinatum. Its anterior border layer is disorganized. In several sections examined, there are found in the posterior layers of the iris several nodules, partially destroying the dilator fibers and pushing the pigment epithelium backward, not unlike the nodules seen in cases of sympathetic ophthalmia. A similar nodule is also found in the anterior border layer. A few minute aggregations of epithelioid cells and lymphocytes are also found on the surface of the iris. The iris, on the whole, is uniformly infiltrated with plasma cells and lymphocytes. The pigment epithelium at the margin of the iris is slightly entropic, and within the pupillary area is seen a thin organized membrane.

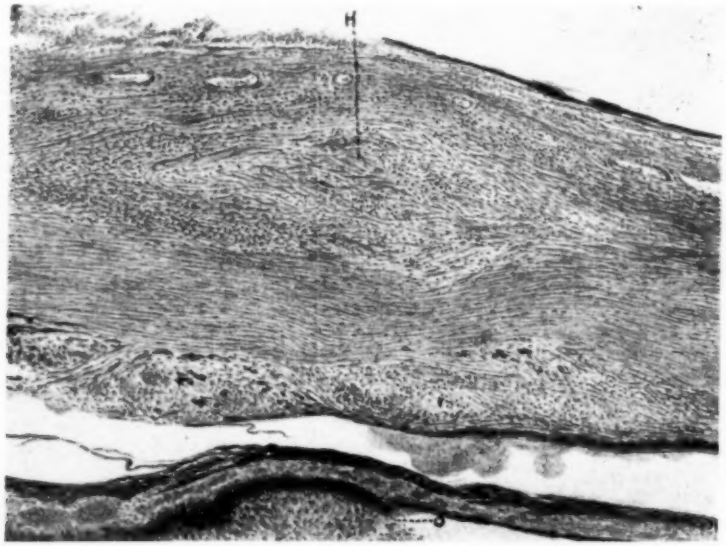

Fig. 4.—Internal tuberculous scleritis, x 58. Marked involvement of deeper layers of sclera, nodules in cicatricial layers. H, healed nodules. O, ora serrata.

Ciliary Body: In certain sections, the anterior part of the ciliary body is found to be involved, most markedly in those sections of the lower segment of the eyeball. The lesion pushes the ciliary muscle backward and inward; a few of the most anterior fibers are destroyed. This nodule is continuous with those situated above and with the nodules in the root of the iris. The conglomeration of this anterior nodule of the ciliary body and those of the iris root pushes the anterior ciliary processes inward, but the processes themselves are not involved. The upper nodules, namely, those which are due to a direct extension from the scleral spur, displace the ciliary muscle slightly in an inward direction. At the insertion of the muscle, the muscle fibers are only slightly affected; they are mostly separated by an insinuation of cells derived from the nodules. The rest of the ciliary muscle and the ciliary processes are not involved.

At the pars plana several nodules are found. They seem to originate from the vascular layer. Some of these nodules are found between the pigmented and the nonpigmented layers of epithelium, partially destroying the former and pushing inward the latter. In certain sections foci are also found on the surface of the nonpigmented epithelium. Some of these foci are quite recent, and some are as advanced in development as those of the cornea and the anterior part of the ciliary body. A few clumps of epithelioid cells and lymphocytes are seen in the vitreous near the affected portion of the pars plana.

Lens: The lens is in situ. There

are no pigment deposits. At the equator, the epithelium shows active proliferation. The lens is undergoing cataractous changes.

Choroid: The choroid is normal.

Retina: The retina shows secondary changes, such as perivascular infiltration and exudation in the internuclear layer.

Optic Nerve: The nervehead is markedly edematous. On either side, the retina is pushed aside.

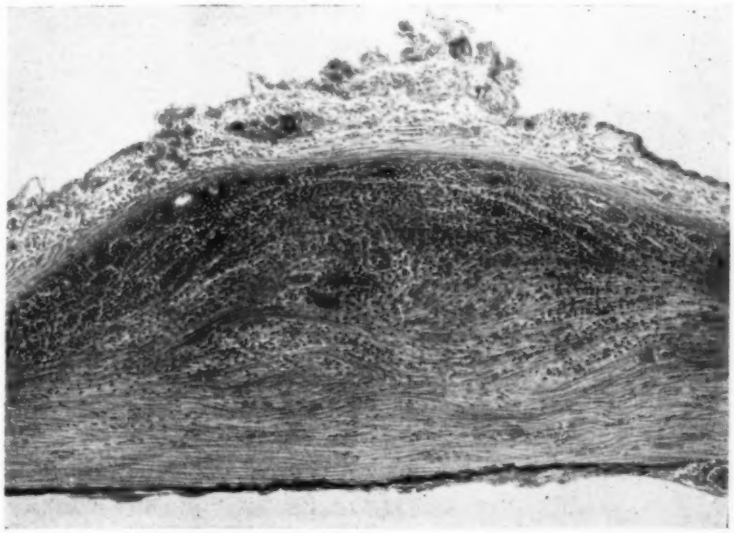

Fig. 5.—Tuberculous episcleritis, x 58. Marked involvement in episclera, as well as sclera, not recognized clinically. Focus about 4 mm. behind limbus.

COMMENT.

Tubercle bacilli were not found in any of the specimens stained by the method of Verhoeff[3]. But on account of the typical histologic findings of the nodules, namely, the central areas of epithelioid and giant cells surrounded by peripheral zones of lymphocytes, the diagnosis of tuberculosis is unmistakable. Altho central necrosis or caseation could hardly be said to have occurred, the most centrally located cells had already begun to show evidences of degeneration. They were more or less shrunken and appeared vacuolated.

Regarding the origin of the infection, the marked nodular infiltration found in the filtration angle indicates probably that the infection is derived from the aqueous, and seems to support Verhoeff's theory. On the other hand, the fact that some of the foci in the sclera and episclera appear to be older than those found in the filtration angle, cornea, and ciliary body, suggests that the scleral foci are primary, and that the sclera was infected by a direct metastasis from the blood. This view is also supported by the presence of the two nodules, one at the equator and the other behind it. These foci can hardly be explained by a direct infection from the aqueous humor in the anterior chamber. This mode of infection, namely, a direct blood metastasis into the sclera, was considered by Verhoeff[3] to be improbable. He states: "On the other hand, it seems altogether improbable that scleritis is due to direct metastases from the blood. Against this is the fact that blood metastases to the sclera in cases of pyemia, malignant tumors, and miliary tuberculosis are practically unknown, if not entirely so." Since his publication, a case of metastatic ophthalmia following a gunshot fracture of the right knee was reported by Lindner[5]. Lindner's case is briefly as follows: The thigh was amputated two days after the fracture on account of gas phlegmon and general sepsis.

A week later, vision of the left eye was lost, and the cornea became opaque. The patient died two days later. Examination of the eye showed that the capillaries of the marginal vascular loop of the cornea, the anterior ciliary veins, and the canal of Schlemm were filled with streptococci, thus proving that the infection was definitely hematogenous.

CONCLUSIONS.

1. The tuberculous nature of the disease is beyond doubt on account of the typical histologic structures found in the nodules, namely, the presence of a central system of epithelioid cells with giant cell formation, surrounded by a peripheral zone of lymphocytes.
2. The infection was probably derived from a primary focus in the sclera which was infected by a direct metastasis from the blood.
3. The nodules in the iris, the anterior part of the ciliary body, and the suprachoroidea were secondary to those of the sclera and the filtration angle.
4. Clinically, there was no evidence of scleritis, but histologically, the anterior segment of the sclera, especially the deeper layers, was markedly involved. It is interesting to note here that a tuberculous scleritis interna may exist without any characteristic external manifestations of scleritis. The typical discoloration in a case of scleritis, if present at all, may be entirely obscured by the presence, at the same time, of a keratitis.
5. In spite of the marked changes in the filtration angle and the presence of peripheral synechiae, the tension was low, which is a common phenomenon in chronic ocular tuberculosis. It may be explained by the fact that in such cases the secretion of the ciliary body is usually interfered with.
6. The cataractous changes in the lens were due either to an alteration of the aqueous or to a diffusion of toxic substances thru the capsule into the lens. Such toxic substances are produced by the tuberculous iridocyclitis. This explains also the presence of a neuroretinitis, because toxins can diffuse backward thru the hyaloid canal.

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THE PATHOGENESIS OF VOSSIUS RING CATARACT.

WILLIAM ZENTMAYER, M. D.,

PHILADELPHIA, PA.

The accidental perforation of the sclera by a needle caused slight bleeding over the anterior surface of the iris. A typical Vossius ring followed. Read before the Section on Ophthalmology, College of Physicians of Philadelphia, April 17, 1924.

At the International Congress of Ophthalmology in 1906, Vossius described an unusual opacity on the anterior capsule of the lens following contusion injuries of the eyeball. The explanation that he gave for this lesion was, that it resulted from an impress of the pupillary border of the iris on the anterior capsule of the lens; and consisted in part of detached iris pigment, and in part of degenerative changes in the anterior lens capsule and of the anterior cortical layers of the lens. He believed that the contact of the iris with the capsule was brought about by dimpling of the cen-

tral area of the cornea by the blow. Later it was demonstrated by others, as a result of experimental work, that a depression of the cornea sufficient to bring it in contact with the iris caused its rupture.

Vossius' explanation was replaced by the theory that the impress of the iris was due to the increased tension in the anterior chamber from the contusion, and this is the usually accepted theory. Hesse, however, from a slit lamp study of two cases, both of which arose from nonperforating injuries of the eyeball, accompanied by hemorrhage into the anterior chamber, contends that the lesion consists not alone of the ring opacity, but of a disciform opacity which becomes thinner as the center of the pupillary area is reached. The margin of the disc is somewhat indented. The opacity is composed of fine points of a brownish color resembling blood, but not at all iris pigment. The portion of the lens immediately surrounding the ring is clear, except for a delicate veiling in the anterior cortical layers. He therefore concluded that this socalled contusion opacity consists of a deposition of a fine layer of blood on the anterior capsule of the lens. He set about to produce the lesion experimentally, but found the difficulties too great because of the quick coagulation of the blood. He did, however, have one partial success, attaining a curvilinear opacity corresponding to a portion of the pupillary border. This had all the characteristics of the accidentally induced lesion.

In Vogt's Atlas there is a diagramatic representation of this condition, as seen with the slit lamp and microscope. He says, that whether this deposition is blood, as Hesse thinks, or a mixture of blood and fuscin pigment granules of the iris, anatomic study can alone demonstrate.

Two months ago, while doing a Worth advancement of an external rectus muscle, I was conscious of having entered the needle rather deeper into the sclera than I had intended, a distance of about 4 mm. from the limbus. In observing the iris to see if the shape of the pupil had been altered by irritation of the ciliary body, I noticed that a sector of the iris was discolored and that this was due to a trickling of blood over its surface. I called the attention of my assistant to it. Soon afterward the patient said that his sight had grown very dim in this eye and asked whether it would remain so. On completion of the operation I examined the media and fundus with an electric ophthalmoscope, but aside from a slight haze in the pupillary area the media were clear. One week later when the bandages were permanently removed, the media were again examined and a typical Vossius ring cataract detected.

The observation was confirmed by my colleague, Dr. Holloway, who endeavored to examine the lesion with the slit microscope but found the eye too irritable. There was no undue reaction following the operation. One month previous, and again the day previous to the operation, ophthalmoscopic examinations were made and the records show that the media were entirely clear.

We were fortunate in accidentally producing exactly the condition which Hesse endeavored to produce artificially, and in obtaining the result which he desired but only partially secured.

This case proves that the Vossius ring can result from the deposition of blood on the anterior capsule as Hesse contends. In the absence of a slit lamp study it is not possible to say whether iris pigment entered into its formation, tho without a contusion it is difficult to see how this could be an element in the pathogenesis.

CONGENITAL ANOMALIES OF THE LENS AS SEEN WITH THE SLIT LAMP.

S. R. GIFFORD, M. A., M. D.,

OMAHA, NEBRASKA.

A series of cases of anomalies of the crystalline lens as observed with the microscope and slit lamp illumination. These include persistent vascular tunic of the lens, congenital nuclear cataract, spear shaped cataract, socalled by Vogt; and forms closely allied to it. These cases are compared with the reported observations of Vogt and others. Reported from the Department of Ophthalmology, University of Nebraska Medical College.

PERSISTENT VASCULAR TUNIC OF THE LENS.

Martha L., a girl of 7, was brought on account of poor vision in the left eye. Vision was R. E. 20/20 and L. E. 20/200, vision in the left eye being unimproved by correction. The left eye diverged considerably, and showed nystagmus on attempted fixation. The ophthalmoscope showed a thin, flat opacity in the deeper portion of the lens, with several small holes thru which a red reflex was obtained. The fundus could be seen fairly well around it, with the pupil dilated, and presented no anomalies. No trace of a persistent hyaloid could be made out, but such could easily have escaped observation on account of the lens opacity. With the slit lamp the opacity was seen to be confined to the region of the posterior capsule. (See Fig. 1.) It was of a roughly quadrilateral shape, with fine processes extending from the angles towards the equator of the lens.

D. C., a boy of 7, presented a very similar condition, except in the shape of the opacity. Vision in the right eye had been poor since birth. At our examination it was 1/200, eccentric, while in the left eye vision of 20/30 was obtained with —4.00 cylinder, axis 5°. The right eye showed the opacity seen in Fig. 2, situated on the posterior lens capsule. By ophthalmoscopy only the dense central portions could be seen, but the slit lamp showed a delicate membrane extending around the borders, and connecting the points of the opacity. No trace of a persistent hyaloid could be made out, but the nerve could not be well seen. Retinoscopy showed myopia of twenty-five diopters, the corresponding lens, however, not improving vision materially.

These two cases, except for the absence of a persistent hyaloid, greatly resemble a case (Case 2) reported in the Journal for July, 1923. As in that case, the opacities undoubtedly represent unusually extensive persistences of the tunica vasculosa lentis. Similar cases are quoted in the former report, and are apparently not very common. As was there brought out, the ordinary Mittendorf's dot, seen by ordinary ophthalmoscopy in 2% of all lenses, represents the common form in which the attachment of the hyaloid artery persists. As Vogt has emphasized, microscopic hyaloid remains can be seen by the slit lamp in a majority of eyes. The exact determination of the location and nature of the opacities in each case made it possible to state with certainty that the condition was not progressive, and to advise against any operative interference.

Figs. 1 and 2.—Opacities at posterior pole of lens.

A case which I believe is of similar nature, altho of a type which I have nowhere seen described, is that of Miss G., a woman of 40, who came for

refraction. Vision was brought to normal with correction of slight myopia, and this was still true two years later, tho an increase of 0.75 D. in her myopia suggested a beginning lens sclerosis. The interesting finding, which was the same at both examinations, was a peculiar linear opacity seen by the ophthalmoscope to be in the deeper portions of both lenses. With the slit lamp this could be located on the posterior capsule of the lens. (See Fig. 3.) No membrane could be made out between the lines, and they may represent a persistence of parts of the vessels only, of the tunica vasculosa lentis. The appearance of the lines, however, suggests the possibility of their representing former ruptures of the capsule from traction by a persistent hyaloid artery. Such thread like remnants at the temporal side of one lens are shown in Fig. 147 of Vogt's Atlas[1], and De Beck also reports a case where such lines covered the posterior capsule[2]. I have seen no reports of symmetric opacities in the center of both posterior capsules at all similar to those observed in this case.

R.E. L.E.

Fig 3.

Fig. 3.—Linear opacities at posterior capsule of lens.

CONGENITAL, EMBRYONAL, NUCLEAR CATARACT.

(Cataracta centralis pulvurulenta.—Congenital embryonal cataract.—Vogt.)

Mrs. M., aged 54, came in on account of poor vision for the past year. Vision was brought up to 20/30 R. E. and 20/20 L. E. with correction for compound hyperopic astigmatism. The ophthalmoscope showed sharply circumscribed, circular opacities in both lenses, exactly in the center of the pupillary areas and about 2 mm. in diameter. These were not very dense, and the retinal vessels could be seen thru them. The fundus, seen plainly around the opacities thru the dilated pupil, showed arteriosclerotic changes.

With the slit lamp, the opacities were located just anterior to the center of each lens. They were composed of white dots of varying size, each surrounded by a brighter ring. (See Fig. 4.) The dots formed a denser central area, surrounded by a border of more thinly distributed dots. The location of the anterior part of the opacity corresponded to the anterior surface of the embryonic nucleus. The embryonal suture lines were not visible.

The picture resembled almost exactly the condition pictured in Figs. 235c and 235d of Vogt's Atlas, which he calls *cataracta centralis pulvurulenta.* This was observed in both eyes of a youth of 18, remained stationary during a year's observation, and was thought to be congenital in origin. The only difference is that in the present case the denser central area was relatively larger, and no differentiation of a "shell," separated by a clearer layer from a denser central portion. In this case the "shell" was more opaque, so that it could not be stated with certainty whether the central portions of the nucleus were affected, or only a zone completely surrounding the embryonal nucleus.

Vogt, in a later work, has described three cases of central opacity, slightly differing from the case pictured in the Atlas, but which he thinks belong

with it, in a group for which he suggests the name *central embryonal cataract.* The first of these three was a woman of 55, whose right eye had been lost, but whose left showed a picture greatly resembling the present case. In the central portion of the lens was a central circular opacity composed of white dots of varying size, each of which was surrounded by a light reflecting ring. Around this central area was a less dense circle of similar dots. The diameter of this outer ring was 1.04 mm., that of the inner one 0.72 mm. A faint suggestion of a third ring, 3 mm. from the outer ring, was also present. Vision was 6/6. Whereas in his previous case, the embryonal suture lines could not be seen, here both sutures could be seen, and the whole opacity was situated between them, its depth being estimated at about half its frontal diameter.

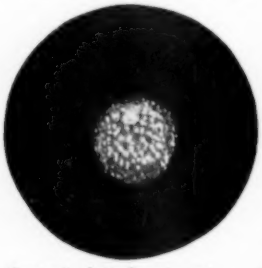

Fig. 4. Central dotted cataract. Appearance from the front.

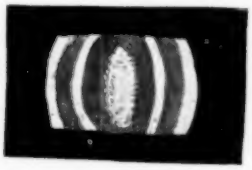

Fig 5. Lens of Fig. 4 in optical section. Small bundle illumination.

Fig. 6. Central opacity of lens, involving back of lens nucleus.

His second case was a boy of 12, whose only eye showed a circular layer of opacities in the region of the anterior embryonal suture lines. It was composed of similar whitish dots, but with a less definite peripheral outline. It was 1.04 mm. in diameter, and about half as much in depth. It covered the anterior embryonal suture, which was invisible, the posterior one being clearly visible. Vision was 0.8. The third case was a woman of 32, both of whose lenses showed a similar condition. This consisted in a very thin layer of similar whitish dots surrounding the ends of the anterior embryonal suture. It was 2.7 mm. in diameter.

These three cases, with the previously reported one, as Vogt points out, are similar in the punctate character of the opacities, their small size, none of them being over 3 mm. in diameter, and none seriously affecting vision, and in their confinement to the region of the embryonal nucleus, the oldest part of the lens. Since the lens vesicle in the 4th fetal month measures about 2 mm. in diameter, the probable time of their formation would seem to be some time in the 3rd fetal month, at the time when the pupillary membrane is beginning to form; a time, that is, when the nutrition of the lens is undergoing a change. This is much later than the cutting off of the lens vesicle, at which time it measures only about .4 mm., and the opacities evidently have nothing to do with this process.

The great similarity of the present case to those described by Vogt seems undoubtedly to place it in the class with his cases. In the same class would seem to fall cases of which a considerable number have been reported in England, and at least two in America, which have been called Coppock cataract, Doyne's discoid cataract, and family nuclear cataract. Vogt was evidently unaware of these reports, and of the light which his investigations with the slit lamp have thrown upon the condition they describe, as he states that his cases are the only ones of this type which he knows of in the literature, except for a case reported by Hess as lamellar cataract, in which the opacity was only 2 mm. in diameter, and which was probably of similar nature to his cases.

He was also apparently unaware of the distinctly hereditary character of the condition. The first report on the subject was that by Nettleship and Ogilvie[4] in 1906, and described the

pedigree of the Coppock family. 150 members of the family were ophthalmoscopically examined, and 18 examples of the peculiar opacity were found, all in the descendants of the first son, and all receiving the characteristic by direct inheritance. Four of the first cases in the family had been originally seen by Doyne. The opacities were alike in being central, symmetric in both eyes, and apparently not progressive, vision being never below 6/12, and often normal. The chief differences between these cataracts and those described by Vogt, are in their size, it being stated that they generally fill a pupil of 4 mm., and in their apparent location between the nucleus and the posterior pole, as determined by parallax.

In 1908, Nettleship[5] reported on a second family of 275 persons, 8 of whom showed the characteristic discoid cataract, 24 lamellar cataract, and 15 retinitis pigmentosa. He believes that there are transitions from the discoid form to the more marked lamellar cataract. Later, Nettleship[6] suggests in explanation of the position of the discoid opacities a possible displacement backwards of the lens nucleus, due to some developmental cause.

Harman[7], in examining the family of a girl with ordinary lamellar cataract, found several members with small opacities just anterior to the nucleus of each lens, which were evidently congenital, and showed no tendency to progress. The location of these opacities would indicate that they probably correspond to Vogt's cases. Priestley Smith[8] gives the pedigree of a family of 102, 26 of whom had the typical discoid opacities, transmitted, as in Nettleship's cases, always by direct inheritance. The opacities in his family seemed, also, to be behind the nucleus. An isolated case of similar opacity was reported by Fisher[9]. Parsons[10] mentions having seen two cases, and Doyne[11] having seen two others outside of the Coppock family. Parsons[12], in 1905, had already described a case with circular opacities 3 mm. in diameter, of a type which he thought probably distinct from lamellar cataract. He located the opacities in the posterior cortex, but not far behind the nucleus, and states that other observers of the same case had thought them to be in the nucleus. Levy[13], in 1906, saw a girl of 16 with sharply defined circular opacities, 3 mm. in diameter, in the position of the nucleus or very slightly behind it. Neither of these observers were then aware of the hereditary tendency of this peculiar type of opacity, or attempted to classify it.

In America, the first report of this condition is the description of a family by Chance[14], in 1907. The father, three sons and a daughter were affected, the wife and one son being unaffected. The opacities resembled in size and location those described by Nettleship; the illustrations (the only pictures of the condition I have seen except those of Nettleship and Vogt) greatly resembled the appearance in the present case. All were apparently stationary and did not seriously affect vision. Crampton[15], in 1910, reported a case whose opacity was considered similar to that of Nettleship's cases, but states that it was 5 to 6 mm. in diameter, which would make it impossible that it affected only the embryonal nucleus. Shumway stated that he has seen two similar cases in a mother and son. A case reported by Reese[16] is possibly of this character, and was thought to be so by Chance. The cases of hereditary cataract described by Brown[17] are evidently much more extensive, and tho spoken of as nuclear, would seem to be lamellar in type.

The crux of the question as to whether the English and American cases of family cataract are to be considered as in the same class with Vogt's cases and the present case is the accuracy of observation of the older observers, with the means at their command, of two points—the size of the opacities and their exact location in the lens. Both of these are matters in which the accuracy of the slit lamp with the small bundle of light presents obvious advantages, and from the great resemblance between the illustrations of the older cases and their clinical descriptions and those of Vogt's cases and the present

one, I am inclined to believe that a slit lamp examination of the older cases would have proved the embryonal nucleus to be affected, and that they would fall into the class of congenital embryonal nuclear cataracts which Vogt describes. It is possible that in many of the cases the opacities were principally in the posterior part of the embryonal nucleus, in the same way in which one of Vogt's cases showed them in the anterior part only, which would account for the parallax phenomenon as reported. The absence of a definite family history of similar lens opacities, in the present case and in Vogt's cases, cannot be considered of importance as separating the two conditions, since I was unable to examine any other members of the family, and the opacities, not affecting vision seriously, would not be noticed unless found during examination for some other condition.

CIRCULAR SUBCAPSULAR OPACITY IN THE ANTERIOR CORTEX.

Mr. P., a man of 65, was seen by Dr. H. Gifford in 1918. At this time vision was brought up to 20/15 in both eyes with +6.00 combined with +1.00 cylinder axis 30 for the right and +6.00 combined with +0.75 cylinder axis 165° for the left eye. It was noted that both lenses showed small opacities about 1/16 inch in diameter. On his second visit, 6 years later, his hyperopia had decreased to 2.50 D. in the right eye and 0.50 D. in the left eye, with astigmatism about the same. Vision, however, with the best correction, was only 20/30 and 20/25 respectively. The circular opacities were observed with the ophthalmoscope in each eye, much resembling a Vossius' ring, when, as sometimes occurs, the central portion of the ring is also opaque. Here the central portions were less opaque than the periphery and a red reflex was obtained thru them. History of injury was denied. No other lens opacities were seen, tho, from the change in refraction, the lenses were apparently undergoing sclerosis, probably entirely independently of the circular opacities, which were evidently the same at both examinations. The decrease in vision, however, was thought to be due most probably to minute central retinal changes, which could not be made out. The slit lamp showed the opacities to be located just under the anterior capsule, the anterior capsular stripe passing uninterrupted over them. The shagreen, or anterior graining of the lens, corresponding to the lens fiber arrangement, is interrupted by the opacities, which come closest to the capsule at the periphery, and each of which shows a central depression like the crater of a volcano. The opacities are slightly brownish in color, and irregularly granular. They are similar in both eyes, the one in the left eye being thinner however, especially at the upper, outer border, making a less perfect circle than in the right eye. They are each about 1.5 to 2 mm. in diameter.

Fig. 7.—Subcapsular anterior lens opacities, seen in optical section.

The exact nature of the opacities in this case is far from clear. I have been unable to find an exactly similar condition described in the literature. The symmetric character of the opacities and absence of any history of trauma seems to rule out a traumatic origin. On the whole, it seems most likely that they are of the same nature as congenital anterior polar cataract, tho they show marked differences from the usual type. The ordinary type is pyramidal in form, the apex projecting

*The difficulty of localizing opacities near the center of lens was illustrated in the present case by the fact that a colleague located the opacities near the posterior pole; while with the ophthalmoscope I was equally certain that I made out a very slight upward movement of the anterior portions of the opacity as the eye moved upward.

forwards, and possessing usually, as Vogt[18] has shown, fine threads connecting it with the lesser iris circle. The primary factor in the ordinary form, as Treacher Collins seems to have proved,[19] is a degeneration of superficial lens fibers, resulting in a proliferation of the epithelium over the degenerated area. The degenerated lens fibers, or their remains, have been seen in sections separated by new-formed lens fibers from the capsular opacity (Collins); and Vogt has shown that an "Abklatsch," or impression of the capsular opacity, can always be seen with the slit lamp at a certain depth in the lens beneath the capsular opacity. In this case there was no evidence of such an "Abklatsch," but the opacity itself seemed to extend into the superficial cortex a slight distance. It is possible that a permanent adhesion between the degenerated lens fibers and the proliferated capsular epithelium was formed, such as Collins describes as occasionally occurring at the posterior pole, which could have prevented the growth of new lens fibers between the two opacities. The "shagreen" of the lens was absent over the opacity as is observed around anterior polar cataracts. The crater like shape of the opacities, the reverse of the ordinary pyramidal form, is hard to explain, unless it is due to pressure from the thickened pupillary border on the corresponding region of the lens, at a time during fetal life when the anterior chamber was empty.

SPEAR CATARACT.

Vogt[20] describes one case of a type which he calls "Spear cataract," and which he thinks may be the same as that called by English observers coralliform cataract. In his case, both eyes of a child of 9 were affected with spiky, branching opacities, running thru the axial portions of the lens, with no definite relation to its fibers or suture lines. One lens which was extracted showed a predominance of cystein on chemical analysis.

I have seen one case, in a boy of 8, who also showed congenital ptosis, with complete paralysis of upward movements, of both eyes. He was very restless and had nystagmus, so that most information was obtained by ordinary oblique illumination and the ophthalmoscope, and the slit lamp simply confirmed the localization of the opacities. They were more regular than in Vogt's case, consisting in fine branching needles or rays, arranged to give the appearance of two conventional fir trees placed base to base, the bases occupying the center of the lens, and the apices coming near the anterior and posterior poles respectively. Two sisters showed the ptosis, and one an anterior polar cataract.

An almost identical condition was seen in both eyes of a dog which was brought to Professor von Szily while I was in the eye clinic at Freiburg, and which he kindly showed me. The interesting and unusual thing about these cases and the one seen by Vogt, is the involvement of all layers of the lens in the axial area. This makes them very hard to explain as developmental defects, and yet their history is strongly suggestive of a congenital origin.

Perhaps the clue is to be found in the family described by Knies[21] with a condition which he calls cataracta fusiformis. The opacities found, while varying greatly from those in Vogt's case, were similar in occupying the axial area, and the variations of the condition seen in different members of the family offer interesting suggestions as to the origin of this group of opacities. In his family, a boy of 14 showed small anterior and posterior polar cataracts in both eyes, connected by a thread like opacity running thru the axis of the lens. Small lamellar cataracts closely surrounding the nucleus were also present, and petal like

I recently saw an almost similar case of circular subcapular opacities of a man of fifty-six. Vision was 20/20 in both eyes with correction. Rings of opacity were seen beneath the capsule of both lenses exactly in the center. The rings were of the same size and smaller than those of the first case, measuring about .4 mm. in diameter. The slit lamp showed the same relation of the opacities to the capsule, these being just beneath it and at the site of intersection of the anterior suture lines. The eye showed no other anomalies, and especially no congenital threads connected with the lesser circle.

excrescences extended from the anterior polar cataracts out under the lens capsule. One brother showed almost the same condition, and a brother and sister anterior polar cataracts, connected with a circular opacity surrounding the nucleus. These central opacities, from his diagrams, suggest very much the embryonal nuclear cataracts previously described. Two other sisters showed unusual degrees of lenticular astigmatism, which he believed to be due to a congenital anomaly in the shape of the lens. Another case, not a member of this family, showed a similar anterior and posterior depression of the lens, with corneal scars pointing to a perforating ulcer as the cause. He quotes a similar case reported by Pilz, with corneal scars and an axial opacity.

From these cases, it would seem possible that some nutritional disturbance very early in fetal life could cause changes in the entire axial area, which would prevent the growth of new lens fibers in a small central area anteriorly and posteriorly, and leave a permanent opacity extending entirely thru the lens. In Müller's[22] case the clinical picture resembled the present case much more closely. One eye, besides a central lamellar cataract and a thin second layer outside it, showed an axial opacity largest at its points of fusion with the central lamellar cataract, and smallest at the anterior and posterior poles. It showed no prominence of the anterior capsule, such as is present with typical polar cataract. The other eye showed a posterior polar opacity with several threads running towards the center of the lens. Two sisters had lamellar cataract. He thinks von Ammon's theory of an early closure of the hyaloid artery a possible explanation of the condition.

Of the English cases, which were called coralliform cataract, that of Gunn[23] was the first to be reported (1895). This was a man of 22, whose poor sight dated from infancy (vision 6/36 in each eye). Both eyes showed peculiar round and oblong opacities near the center of each lens, with peculiar processes, some appearing tubular, extending in all directions from the center. Fine iridescent crystals were present in the clearer parts of the lenses. This case was a member of the family reported on more fully by Nettleship[24]. Thirty persons in five generations were affected with cataract, the trait being continuously transmitted, and in 19 cases personally examined, the opacities closely resembled those described by Gunn. In another family, Nettleship saw a mother, daughter, and five grandchildren affected with a probably similar condition. Another isolated case was seen by him. While in all these cases the condition was apparently congenital and stationary, Fisher[25] saw one in which vision failed in the only eye in four years from 6/18 to 6/60, and later the opacity affected the whole lens. In the beginning it closely resembled Gunn's case. Stephenson's case[26] tho called "coralliform" seems to have been rather an unusual form of lamellar cataract, with tiny tubules of opacity projecting in all directions from the central mass. In Langenhan's case[27] the appearance was similar to Vogt's picture. The opacities did not reach the anterior capsule, and the clearer parts of the lens between the opacities showed many shiny plates, probably cholesterin crystals. The patient had rickets.

In their general characteristics, the English cases and those of Müller and Langenhan would seem to belong in the same group as Vogt's and the author's cases, in spite of the lamellar changes seen in some of them. It seems likely, also, that Knies' cases are of similar nature, and may help in explaining the others.

Since the above was written I have been able to examine the sister and the son of Mrs. N. Neither showed any signs of the characteristic lens opacities.

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OCULAR SYMPTOMS OF DISTURBED CEREBRAL CIRCULATION

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An outline of the eye symptoms characteristic of each of the following vascular lesions is given: Hemorrhage of the brain, thrombosis of the cerebral sinuses, aneurysm, arteriosclerosis, angiospasm and migrain, alone or followed by permanent lesions. Illustrative cases are cited and three cases reported illustrating the three types of migrain, ophthalmic, ophthalmoplegic and psychic.

(1) *Hemorrhage of the Brain.* In 44 cases diagnosed as either cerebral hemorrhage or thrombosis, Foster Moore found 70 per cent showed disease of the retinal arteries, 40 per cent severe in degree. This will be further discussed under arteriosclerosis.

Disease of the optic nerve is rare in cerebral hemorrhage, tho optic neuritis and even choked disc are occasionally seen. In fractures of the base of the skull, however, with extensive hemorrhage, optic neuritis or choked disc, with or without impaired vision, may come on immediately after the injury and in a few weeks may disappear without ill results. It is to be distinguished from inflammation of the optic nerve appearing gradually, a little later and due to meningitis, of which other symptoms will almost certainly be present.

The ocular muscles and the field of vision are often affected by cerebral hemorrhage. Perhaps the most common symptom is hemianopsia with hemiplegia due to hemorrhage in the internal capsule; the hemianopsia is said to be sometimes transitory, but in the cases I have seen it continued, partly or completely, long after the paralysis had almost if not quite disappeared. It is likely, in a measure at least, to be permanent.

Hemianopsia may also be due to hemorrhages in the occipital cortex; but the lesion (unless traumatic) here is more likely to be embolism or thrombosis and will be considered under that head.

Conjugate Deviation (head and eyes turned in the same direction) is often due to hemorrhage in the brain. Isolated paralyses of the ocular muscles (manifested by double sight and squint)

are rarely due to hemorrhage. Paralysis of the abducens (which turns the eye outward) is however not rare after injuries to the skull. I have seen several which recovered in some weeks. It is said to be due usually to pressure at the base, tho sometimes to nuclear hemorrhage.

(2) *Thrombosis of Cerebral Sinuses.* This is of two varieties, the marasmic and the infective. We are concerned only with infective thrombosis of the lateral and cavernous sinuses.

Thrombosis of the lateral sinus is a serious and not very rare complication of suppurative otitis media; in a proportion of cases, estimated at from 25 to 50 per cent, it produces optic neuritis (usually bilateral); this is said to occur generally when there is meningitis or brain abscess as well as thrombosis; and therefore makes the prognosis more grave. In several cases of lateral sinus thrombosis without these complications, I have rarely if ever seen optic neuritis.

Thrombosis of the Cavernous Sinus is rare. If we omit orbital cellulitis from facial erysipelas, in which the symptoms greatly resemble this disease and which indeed sometimes causes it, I have seen only one case in which I felt sure of the diagnosis. With the general symptoms of brain disease and infection, fever, headache, and perhaps chills, there are marked exophthalmos, edema of the lids, chemosis and paralysis of the ocular muscles, causing immobility of the eyeball. Surgical procedures have been carried out in a few cases, but without success. The mortality is certainly over 90 per cent—so high, that a recovery may throw some doubt on the diagnosis. The common causes are infection from the face, nose, sinuses and throat, and extension from thrombosis of the lateral sinus. In at least one half of the cases extension to the sinus of the other side takes place. In the case I saw the symptoms were typical, except that the site of the infection was unusual—a boil on the back of the neck in a vigorous athletic young man. He died a day or two after my examination.

In addition to the external symptoms, just described, there is often but not always optic neuritis.

(3) *Minute Thrombi or Embolism.* Most likely thrombi are, in the absence of injury, responsible for the socalled cortical hemianopsia. The disturbance of vision, tho symmetric, may involve only a sector or quadrant of the field. A typical case was seen by me in a gentleman in the late 60's, without heart or kidney disease or arteriosclerosis, discoverable at the time. He was told that the defect would remain as it was; this proved true, until his death several years later from cardiorenal affection.

(4) *Aneurysm of Cerebral Arteries.* According to Osler aneurysms of considerable size (not miliary) are found not very rarely in the vessels of the brain, postmortem. He states that the first intimation is usually rupture and fatal apoplexy, and that diagnosis as a rule is impossible, tho pressure of a carotid aneurysm on the optic chiasm or nerve may produce hemianopsia or optic neuritis. I have seen one of these cases, causing blindness in both eyes, tho at intervals of some years, come to autopsy. A middle-aged lady had long suffered from violent headaches and vague pains which were called rheumatic. Finally she consulted me for dimness of vision in the left eye. Her sight was somewhat reduced and steadily tho slowly became worse. At first ophthalmoscopic examination was negative, but later there was a mild optic neuritis which gradually went on to atrophy and loss of sight. I made a diagnosis of optic neuritis, beginning retrobulbar and advancing towards the eye. Consultation was declined, but some weeks later she consulted a distinguished oculist in another city who, even before she gave him my letter, made exactly the same diagnosis that I had made, and we both assured her that there was no danger whatever of the other eye ever being affected. About two years later on Christmas Eve she came to me in much alarm saying that her good eye was getting dim. At this visit the sight was nearly or quite perfect and the appearance nearly normal, but in a few days the sight was greatly impaired, there was blurring of the outlines of the disc and edema of the retina.

A colleague, now deceased, saw her

with me and we sent her in all haste to Baltimore to see a neurologic surgeon. He did a decompression. She became entirely blind but lived for several years. Postmortem showed numerous aneurysmal dilatations, some pressing on each optic nerve.

(5) *Arteriosclerosis.* In passing it is well to note that certain ocular symptoms are often due to general arteriosclerosis particularly as it affects the brain. Such symptoms are chiefly dizziness, headache, momentary blurring of vision and discomfort in the eye use.

I am inclined to the belief that neither the internist nor the oculist use to the best advantage a careful examination of the retinal vessels, the internist because he too rarely sends such cases for examination, and the oculist because in the routine examination of middle-aged or old persons he does not usually employ a mydriatic, and ophthalmoscopic examination cannot be thoro without it.

We will consider first the changes in the retinal vessels visible with the ophthalmoscope, second the relation of these changes to the cerebral circulation, and third their importance in prognosis. Of course immediate and careful investigation of the kidneys and circulatory system is imperative. Slight but suggestive retinal changes are undue tortuosity of the vessels, especially the smaller twigs around the macula; blurring of the edges of the disc and broadening of the light streak of the arteries. More positive signs are marked variations in the caliber of the vessels, contractions and dilatations, white streaks along the vessel walls and distention of the veins on either side of the arterial crossings. Finally even with no kidney symptoms discoverable we may have a retinitis with exudates called by Foster Moore arteriosclerotic retinitis, and we often have hemorrhages.

It is of great importance to remember that with all these conditions vision may be perfect.

Now as to the relation of these retinal conditions to the circulation in the brain. The consensus of opinion seems to be that arteriosclerosis of the retina always indicates a similar condition in the brain; but that in about 30 per cent of the brain cases the retina is normal.

The prognosis of retinitis in chronic nephritis is well known. Few survive beyond eighteen months or two years.

High blood pressure and retinal arteriosclerosis, especially with retinitis or hemorrhages, is also ominous even when kidney disease is absent, and yet many of these cases live a useful life for many years.

(6) *Probable Transient Angiospasm.—Migrain,* with very rarely thrombosis and permanent symptoms. I am well aware that the pathology of migrain is still unknown. Oculists lean strongly to the view that it is caused by spasm of the vessels of the brain. Fuchs, whose book has been called the Bible of the ophthalmologist, says that the symptoms can be accounted for only on the theory of a temporary disturbance of brain circulation. Osler also seems to accept this as the most probable hypothesis, and states that in no other way can many of the symptoms, such as temporary hemiplegia, be explained.

James Hendrie Lloyd, who writes on this subject in Posey and Spiller's, "The Eye and Nervous System" divides migrain into three groups, the ophthalmic (far the most common), the ophthalmoplegic and the psychic.

Knapp, de Schweinitz and others speak of the symptoms occasionally tho very rarely becoming permanent. The name, Scintillating Scotoma, has been given to migrain because in certain cases the patient sees a flashing zig-zag line of light, surrounding or to the side of a dark spot. But the ocular symptoms take various forms; sometimes blurred vision, sometimes seeing colors and sometimes distinct half-sightedness—typical hemianopsia.

The latter seems to have been true in Abernethy's case, as he said when he looked at his name he could only see the ne and thy. Frequently the attack is preceded by an aura—perhaps dizziness, perhaps numbness in the hand or arm; then the ocular symptoms, the violent headache and later vomiting and relief. In the rare cases of permanent symptoms it seems prob-

able that the spasm of the vessels has been followed by thrombosis.

The following illustrate Lloyd's three types and seem worthy of report, as in two of them permanent hemianopsia occurred, while the third is one of the rare cases of recurring ophthalmoplegic migrain. It is quite likely that there may be a difference of opinion as to these cases, particularly the one I have designated as psychic migrain, but I submit them for your consideration. Ordinary cases of sick headache with eye symptoms are too common to need illustration.

Ophthalmic Migrain of many years duration finally resulting in permanent hemianopsia: A lady of about 67, but well preserved, gave the following history: From youth she had been subject to severe headache, with various ocular symptoms (generally half-sightedness) and vomiting. When about fifty years of age the attacks became less severe, and after a time the headaches and vomiting ceased, but she continued to have spells of half-sightedness. Some months before consulting me she had such a spell and the half-sightedness had continued since then. She had typical hemianopsia, but no other symptom of ocular or nervous disease. Fortunately the hemianopsia in these cases does not involve the fovea, so direct vision is good.

I expressed the opinion that the condition would remain and was due either to a rupture or a clot in a small vessel in the brain, which had previously been subject to spasmodic attacks. This was five or six years ago and her son has recently told me that the condition is unchanged.

Recurring Ophthalmoplegic Migrain. About two years ago I was asked by a neurologist to see a lady of about 35, long subject to headaches. A few days before I saw her she had severe pain in the right eye, brow and temple, lasting a day or two and followed by a drooping of the lid. On raising the latter all the muscles supplied by the motor oculi were found paralyzed. The ophthalmoscopic picture was normal; her health otherwise was good and no source of focal infection could be found. I made the diagnosis of ophthalmoplegic migrain, and the prognosis that she would recover from this attack but would have a recurrence. She recovered in some weeks. Her physician tells me she is now suffering from another attack, the second since the first one in which I saw her.

Combined Psychic and Ophthalmic Migrain. A young man of 26 gives the following history: His father was subject to violent sick headaches until past 50 years of age, when they gradually disappeared. His sister was subject to similar attacks. He himself had sick headaches since boyhood. Last October he observed on two occasions distinct half-sightedness of brief duration—everything on the right side being dark. Soon after these attacks he ate rather imprudently and took a very small amount of whiskey—too little to affect anyone ordinarily. He rapidly became confused and had difficulty in finding his way back to his room; there was sick stomach and the next day a little fever. He was up and about after a few days, or a week, but from the onset of the attack to this time he has had hemianopsia on the right side. He has been examined by many physicians, Wassermanns both of spinal fluid and blood were negative, and focal infections have been looked for with negative results.

OBSERVATIONS ON REFRACTION.

P. N. K. Schwenk, M. D.,

PHILADELPHIA, PA.

In a series of 22,000 patients more than 83 percent required correction of refraction. The causes for selecting duboisin as the cycloplegic are given. Some cases of very high astigmatism are reported. The heterophoria found after cataract extraction is referred to. Read before the Section on Ophthalmology, College of Physicians of Philadelphia, November 18, 1923.

In examining the contents of seventy-five record books, having nearly three hundred pages each, and containing the findings of 21,812 patients, I found 17,826 or 81.7 per cent of the cases came for the correction of their ametropia. 440 or 2 per cent refused drops and, therefore, I declined to treat them, but these added to the ametropic patients—where they rightly belong—makes 18,268 out of 21,812 or 83.7 per cent were patients who came for refraction correction. From these figures we readily see the great importance for qualifying ourselves to the utmost in mastering both the science and art of refraction, as upon this largely depends our success.

The tendency is to make refraction work secondary to diseases of the eye in general, but this is a mistake since 83.7 per cent of an oculist's work is the correction of ametropia. Good refraction is not common, because the students of today look upon it as tiresome and shun the work, and thus fail to note the minute details necessary to bring about the best end results.

When refracting a patient it is necessary to make him feel at ease and impress upon him the importance of getting the best findings possible, without yourself becoming impatient. With the Post-graduate Schools of Ophthalmology giving a two years' course on diseases of the eye, the young doctor, entering the field of ophthalmology has no excuse for not becoming proficient in eye work.

The various cycloplegics are too well known to all and, therefore, it is unnecessary to enumerate them. I have long ago (1887) stopped refracting with homatropin—now the most commonly used cycloplegic—because of its variable strength and failure to produce complete ciliary paralysis. Another reason for doing so was the uncertainty of getting the right drug.

In April, 1887, I refracted Dr. M. of Lancaster, Pa. with homatropin followed by four instillations of supposed eserin, but the eserin proved to be duboisia, which was taken out of a bottle labeled eserin (Merck)—as was shown to me by the druggist who compounded it—which caused motor paralysis in my patient lasting four hours.

At another time I ordered duboisia for a druggist's wife, who came to my office next morning having miotic pupils. The preparation was eserin taken from a bottle labeled duboisia. In all, four such cross labeled cases came under my observation. In 1903 another case occurred to the late Dr. Harlan, who suspecting glaucoma in a patient of his, ordered eserin, but got duboisia, and with the pupil rapidly getting larger he performed an iridectomy.

Upon investigation by a wholesale drug house, they discovered that three lots of drugs were cross labeled in Merck's laboratory, and put on the market in 1883. Since then I use duboisia in all patients below 42 years of age.

My procedure, in all cases below 42 years of age, is as follows: I take name, address, age and the history of patient in full, note his or her physical condition, family history, past and present ailments. I then take the acuity of vision, note state of eyes, appendages, cilia, lids, muscles, conjunctiva, cornea and pupils. I then order duboisia sulphat, gr. ⅛th to ½ dram of water, directing the patient to have some member of the family pull up the outer third of upper lid and have one drop of duboisia pass underneath lid. In this way the drop will pass all over the cornea and there will none get into the lacrimal canal and into the throat. I ask that one drop be put in each eye the night before and morning of coming, and wear

dark glasses. I have patient repeat the drops at noon, evening and next morning. I make two refractions two mornings in succession. It has often occurred to me that instilling drops in the lower culdesac fails to bring about as good results as when put in above, as I have stated, as then none is lost or washed out by the tears. I believe since doing so I have better effect of drug used.

Duboisia, like atropin, causes muscular depression with delirium but, if instilled as I have directed, there is not any danger. An important point overlooked by both doctor and druggist in compounding alkaloids is the size or kind of dropper to be used; the manufacturers tell the druggist what dropper to use instead of druggists asking them to make a pipette which is to the interest of their patrons. The dropper I prescribe comes to a small point. The beaded dropper should be condemned, as it gives a larger drop than is intended. Since using duboisia, as stated above, my results are more reliable and permanent. Right here I might state that in 65 per cent of hypermetropes, after 18 years of age, their refraction remains unchanged until presbyopia sets in.

My method of refracting patients under 42 years of age is: The patient having used the duboisia, as directed, I first shadow test all cases, then examine the fundi, refract and test muscles. I refract all patients twice, two consecutive mornings. I do my own refracting and recording. The shadow test has proven a time saver to me and has been most helpful in determining the amount and kind of ametropia present; besides excluding any disturbance in the media. I am much indebted to Dr. Edward Jackson for his early descriptions of this valuable aid on my first entering the field of ophthalmology.

My shadow test case consists of six plus and three minus spherical lenses, the handles being marked on each side. These lenses suffice to shadow test 90 per cent of all ametropic patients. I come to within 2. to 2.50 diopters for reverse of shadow, as the nearer the observation the more clearly (Jackson) can you perceive the movement of the shadow; especially is this true in presbyopes, where you have a small pupil.

I refract all cases over 42 years of age without a cycloplegic, using a weak mydriatic to dilate the pupil if fundi can not well be seen. In my experience the Jews become presbyopic three years earlier than any other class of people.

I give a correction to all patients having a simple hypermetropia of one diopter or more. If less than one I have patient wear full correction for near work; but, if any astigmatism is present, be it ever so little, I give all the astigmatism—as low astigmatic patients are some of our most grateful clients—and as much of the sphere as suits the case. Occupation, habits and physical condition of patient are important factors to be considered. I correct hyperphoria, if not over six degrees and fusion can be obtained by so doing.

I do not use eserin after refraction with duboisia, as the rest of an eye under influence of a cycloplegic is to the eye what a vacation is to a busy doctor. I seldom do a postcycloplegic, only in irregular astigmatic cases.

The style of glasses is important. I do not approve of the round lenses for various reasons; but, the principal one is that they turn in the frame and thus changes the axis, if any astigmatism is present; and often the lenses are too large and decentered. I prefer the oval frameless spectacles, as they can be fitted to the patient.

As already stated, many problems arise as to what correction should be given—such as occupation, physical condition and habits of patient. In all cases I give all of the cylinder findings, and deduct +.50 to +1. diopter sph. according to amount of hypermetropia, if patient is hypermetropic. In myopia I give full correction in all cases. When the myopia is 5. diopters or more I add +1. bifocal, regardless of age this side of 42 years, if 8. diopters I add +1.50 bifocal and so on. I test the muscles in all patients and,

if the exophoria is over two degrees, I correct anything over four degrees according to strength of correcting glass; I add prisms to correcting glass until fusion is obtained, if possible. I practice lateral exercises in exophoria patients, and in low myopes I give a little overcorrection in order to excite convergent effort.

RARE REFRACTIONS.

On the 10th of August, 1892, Rev. N. D., aged 58 years, of Berlin, Ontario, Canada, came to my office with a patient and casually stated that he had never been able to get a pair of glasses, naming many noted oculists, some of whom I knew. By means of the shadow test I found that he required the following:—R. E. +0.50 ⊂ −6. cyl. ax. 90°=6/9. L. E. −7. cyl. ax. 90°=6/9.

At that time there was no mould having this curve, but at last the optician found that a beer bottle gave the proper shape by which the glasses could be made. The parson did not like the idea that a beer bottle should serve him.

In May, 1890, I refracted Wm. McD., aged 18 years, showing the following:—R. E. −16. cyl. ax. 10°=20/50. L. E. +6. ⊂ −16. cyl. ax. 150°=20/50.

He wore this correction until February 1st, 1911, 21 years, when I gave him R. E. −18. cyl. ax. 10°=20/50. L. E. +6. ⊂ −21. cyl. ax. 130°=20/50.

In March, 1922, R. E. +2. ⊂ −18. cyl. ax. 5°=20/50. L. E. +6. ⊂ −19. cyl. ax. 110°=20/50.

I ordered full correction with +3. bifocal.

Miss Edna G., R. E. −2. ⊂ + 18. cyl. ax. 5°=20/30. L. E. −1.50 ⊂ + 12. cyl. ax. 30°=20/30.

It is acceded that the Germans are regarded to be generally near sighted more so than any other race. Here is one of many Germans that have come under my observation:—

Miss D. J., aged 19 years; with duboisia, R. E. +4.50⊂+2.50 cyl. ax. 90° =20/20 mostly. L. E. +4.50 ⊂ +2. cyl. ax. 90°=20/20.

HETEROPHORIA.

After cataracts have been removed from each eye, there is invariably heterophoria which can be relieved by prisms. In these cases I correct two-thirds of the heterophoria by prisms, or as much as the patient may require. For dentists I order a full near glass, if presbyopic I add a minus segment above equal to presbyopic glass added, making the upper part of glass emmetropic or equal to distance correction. A sudden increase of hypermetropia in adults should be looked upon as a premonitory symptom of approaching brain tumor. I have three such cases on record and I give this for future observation. I have noticed an increase of hypermetropia in cases of retinal and choroidal disturbances.

THE CAMPIMETER RECORDING AND PLOTTING CHART.

JOHN N. EVANS, M. D.,

BROOKLYN, N. Y.

A simple method of getting records of fields as taken on the campimeter is here described. The various dimensions and normal averages accepted by different authors are given in tabular form. A table of tangent values of angles from 1 minute to 60 degrees is appended.

The time has come when the neurologist, the internist and, particularly, the oto-rhinologist is ready and anxious to make visual field studies a part of his office routine. The ophthalmologist has succeeded in arousing this active interest. Present instruments seem too elaborate in their technic, to men unaccustomed to refined degrees of subjective testing. The main objection seems to revert to the point, that more time is often consumed in copying a plotting onto the final record than is consumed in making the actual test. The almost valueless automatic perimeters are ostracized by those who have been responsible for the development of visual field studies. A growing demand for a rapid and accurate means of measuring blind spots

and central scotoma is felt in the eye clinic, and unless this has a minimum of technical processes it will not be used.

with the normal blind spot and radiating lines, as shown in the illustration, as efficient an instrument is produced as any of this type on the market.

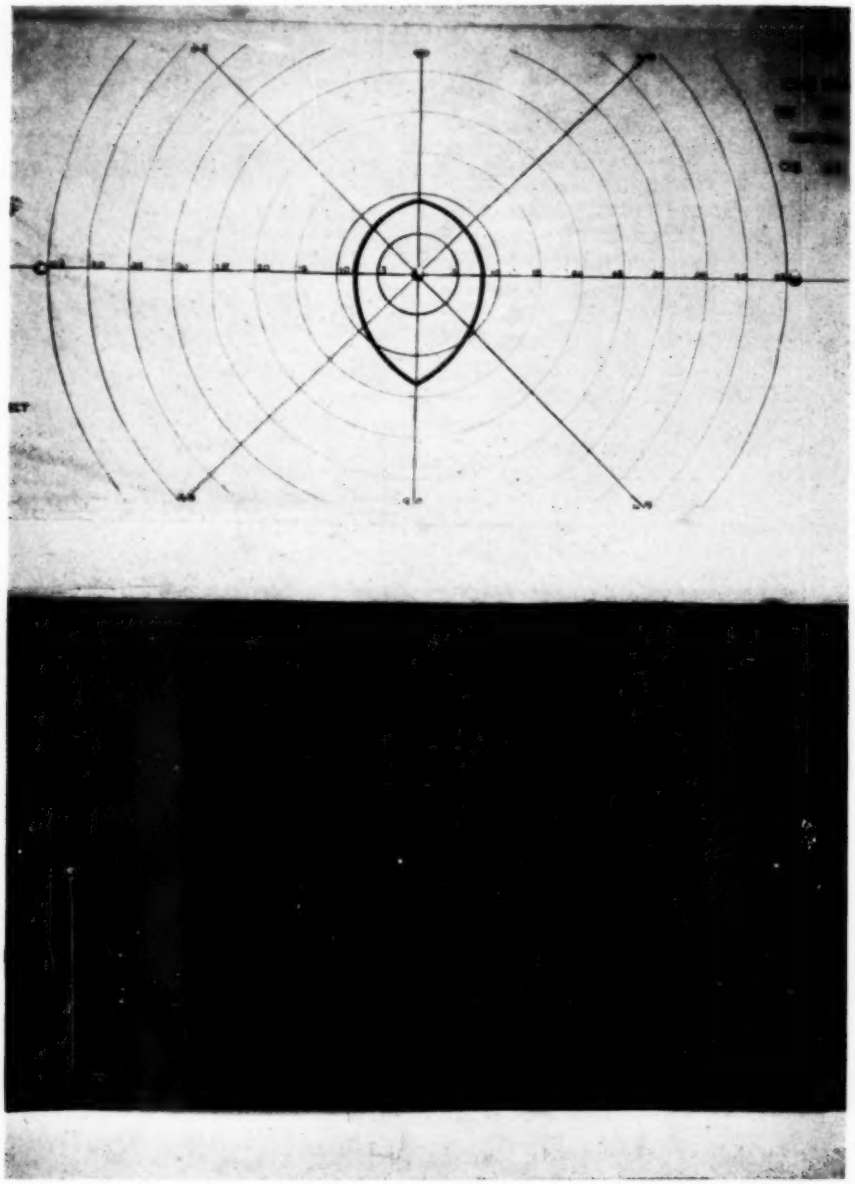

Fig. 1.—Half sheet of black paper with three holes for fixation below. Chart with outlines for record above.

If half a sheet of dull black kindergarten paper* be marked on the back

It is simply attached to a wall or black felt covered board, the points of appearance and disappearance marked by pin pricks. When the test is completed a permanent record has been

*Prang & Company, New York City, make this paper in sheets 20"x24", which, if divided longitudinally, makes two of the charts or, if left the full size, gives a greater vertical field.

made, and is ready to file. The material and printing cost of such an outfit is slight. It is accurate and takes less than 50 per cent of the time and energy, as compared with the usual forms. The following description completes the necessary information for use and construction of the more finished instrument.

The Tangent Screen Direct Plotting Chart is for use at 75 centimeters (30 inches). The dead black surface is to be attached to the black surface of the screen or wall, so as to face the

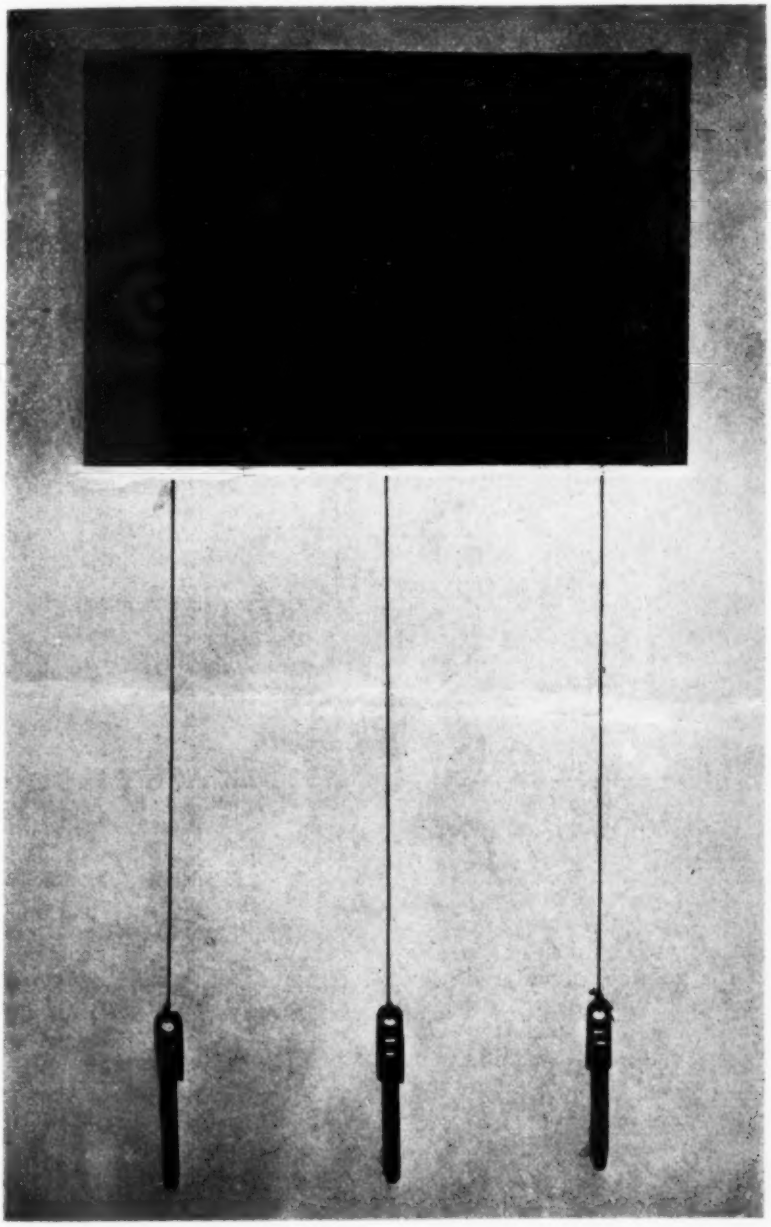

Fig. 2.—Screen with cords attached and a tongue depressor to grip between teeth for accurate fixation.

patient. When it is desired to investigate the paracentral and central regions the central hole of the chart is fixed. When it is desired to map the blind spot for the right eye the hole at the left end of the chart is fixed. When it is desired to plot the blind spot of the left eye the hole at the right hand is fixed. The oval figure at the center is the diagrammatic outline of a normal blind spot, calculated from Gradle's and Marlow's figures for the distance of 75 centimeters. It is to be noted that the distance between the normal border of the blind spot and the point of fixation does not exactly coincide when constructed as a composite in the diagram. The variation, however, comes well within the normal average. The radiating lines represent the main meridians. The circles are placed at arbitrary distances, as spacing for degrees would make the chart too complicated to be practical (on account of the three positions). The object carrier should be provided with a pin on its end so that a hole may be pricked in the chart when the patient announces an appearance or disappearance of the object. When the test is over the chart is detached from the screen. The date, etc. on the diagram side is filled in and the pin holes connected by a line, so as to make a map of the scotoma, and to prevent confusion should the same chart be used for another test on the patient. The chart is sufficiently thin paper so that it may be filed conveniently. Discs of two, three and five millimeters seem to be the most practical objects. It is self evident that this method of plotting and recording is adaptable to the Lloyd Stereocampimeter and the Peter Campimeter, as well as some others, and would greatly reduce the technic of these valuable instruments. A small wall board covered with black felt and slightly larger than the chart makes an ideal screen.

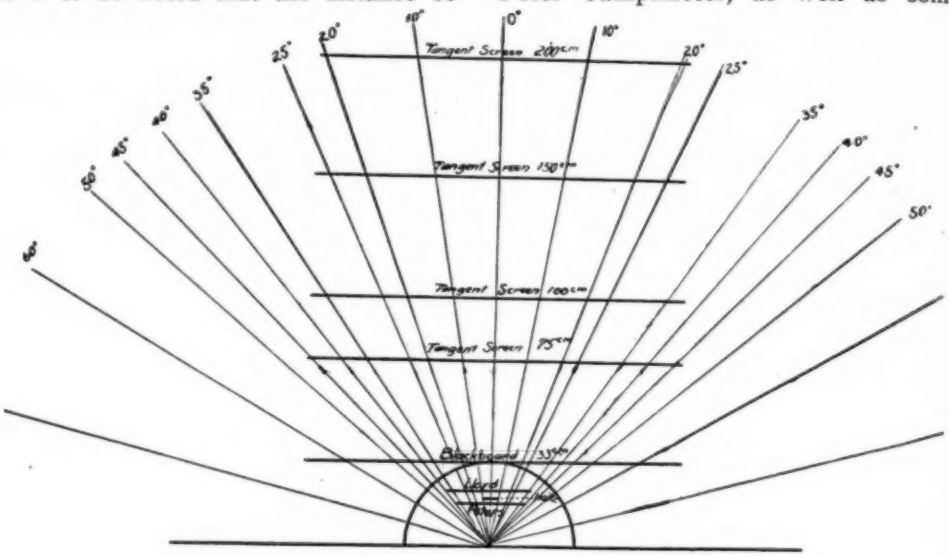

Diagram Showing the Field Range of Various Instruments

Fig. 3.

If a strong black cord (75 centimeters) be attached by one end to the screen, about three inches under the fixation point, and its other end be provided with a toothed clip (such as is used for holding show cards) a standard wooden tongue depressor may be attached so that the patient can grip it between his lateral teeth and so maintain accurate fixation. A separate cord

and clip will, of course, be needed for each fixation point.

In the construction of this little "direct plotting chart" it is valuable to consider the various advantages and disadvantages of standard types of instruments as regards their field range.

If that section of the field be selected thru the horizontal meridian, which will include the blind spot, the most valuable points will be uncovered. The accompanying diagram, 3, drawn to scale, illustrates the useful field range, and the accompanying table adds such data as will give a clear understanding of the scope and value of each type of instrument. Since, however, the writer has been unable to find a satisfactory discussion of this problem in the literature he feels justified in outlining the procedure for determining the linear equivalents of arc degrees upon a tangent surface.

In order to calculate the projection of arc degrees upon a tangent surface we must know the distance at which the screen is located from the center of fixation. We must also decide what portion of the arc we wish to represent. By Fig. 4 it will readily be understood that five degrees near the line of fixation (as O_1—P) will not represent as great a linear distance (as R_1—P_1) as five degrees more remotely situated (as S—R_2).

Suppose we wish to project upon the tangent screen, at P_1 millimeters distance, a point which will represent O degrees from the point of fixation (P) on a perimeter. We look up in a book on tables, or the table on p. 696 the tangent value for O degrees and multiply it by the distance P_1 millimeters. (From the tangent screen to the nodal point of fixing eye. See diagram). The result will be the location in millimeters of the point R from the line of fixation of the projected O degrees, or the distance RP_1.

In the same way we can project angles of greater or less values, as O_2 to R_2, or O_1 to R_1, and the segments of the screen between these projections will be true representations of the corresponding segments of the perimetric arc. This is, perhaps, a less direct way of calculating than were we to substitute all values in a single formula, but the calculations are greatly simplified by this procedure.

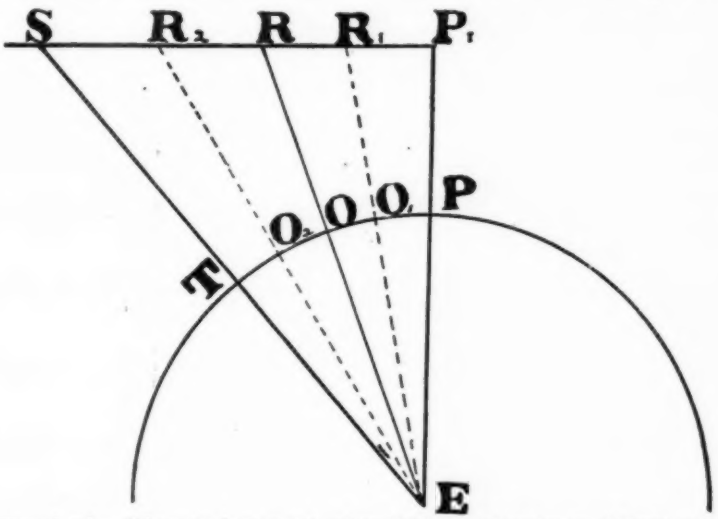

Fig. 4. Diagram showing differences in tangents subtended by equal angles on different parts of the arc.

Should we wish to determine the breadth of the blind spot from the point of fixation we determine the location of the nasal border, then the temporal, from the point of fixation, and their difference will represent the area between, or width we desire. Since the horizontal meridian does not exactly bisect the blind spot we must calculate the two parts separately and add the

results, in order to get the vertical diameter. Since all arcs of the same degree are similar, it is but a matter of proportion to calculate in millimeters the projection of a portion of one arc on another.

The location and dimensions of the blind spot are given in degrees by the various workers, thus:—

	Point of fixation of nasal border	Above horizontal	Vertical diameter	Horizontal diameter
Gradle	13° 15′ 35″	2° 58′	7° 45′	4° 54′
Peter	15° 49′	2°	7° 40′	5° 28′
Marlow	13°	2° 56′	7° 56′	6° 9′

The appended tabulated approximate angular measurements (practical for working diagrams) are taken from Marlow's analysis of present accumulated statistics. (Incidentally, they correspond with Gradle's figures.) Bishop Harman does not state the angular size of the blind spot on his instrument. Lloyd used Gradle's figures; Peter his own, so that their actual measurements vary slightly from the above. The blind spot will not appear on the Haitz chart unless the eye be excentrically fixed in a nasolateral position.

Instrument and marker.	Distance from eye	Useful field range				Projected Dimensions of Blind Spot.			
		above	below	nasal	temporal	Fixation point to nasal border	Diameter on horizontal meridian	Extent above horizontal	Below horizontal
						13°	6°	2°	
Tangent Screen (measures 1415 mm. by 1300)	2000 mm.	20°	20°	20°	20°	462 mm.	227 mm.	70 mm.	210 mm.
	1500 mm.	25°	25°	25°	25°	346 mm.	170 mm.	53 mm.	158 mm.
	1000 mm.	35°	35°	35°	35°	231 mm.	113 mm.	33 mm.	105 mm.
	750 mm.	45°	45°	45°	45°	173 mm.	85 mm.	26 mm.	80 mm.
Bishop Harman Campimeter 324x39	330 mm.	17°	17°	26°	26°	76 mm.	37 mm.	12 mm.	35 mm.
Perimeter (Rand and Ferree)	330 mm.	45°	55°	65°	90°	76 mm.	37 mm.	12 mm.	35 mm.
Haitz Charts (170x80 mm.)	191 mm.	10°	10°	10°	10°	44 mm.	22 mm.		
Stereo-campimeter (Lloyd) (297x165)	100 mm.	25°	25°	10°	40°	44 mm.	22 mm.	7 mm.	20 mm.
Peter's Campimeter (272x272)	165 mm.	40°	40°	40°	40°	38 mm.	19 mm.	6 mm.	17 mm.

THE ORGANIZATION OF AN EFFICIENT DEPARTMENT OF OPHTHALMOLOGY IN A HOSPITAL.

EMORY HILL, M. D., F. A. C. S.

RICHMOND, VIRGINIA.

The development of ophthalmology from the specialty of surgery thru recognition of errors of refraction to medical ophthalmology and ophthalmic diagnosis is traced. The ophthalmic department must take care of ocular diseases and injuries and cooperate closely with other departments in the study of cases, both as to general causes of eye disease and ocular symptoms of general disease. Its educational function is also important and it must include a highly organized outpatient service

Ophthalmology has developed in a manner which is not conducive to modern hospital efficiency. The specialty was first surgical, growing out of general surgery, and special hospitals in the main cared for patients who required ophthalmic surgery. Slowly, refraction work gained recognition as a legitimate part of the ophthalmologist's routine. This was office work, consuming much time, lengthening office hours and shortening hospital rounds. Still more slowly came the recognition of the vast importance of medical ophthalmology and ophthalmic diagnosis in relation to medical, neurologic and neurosurgical cases. Today ophthalmology should be mainly a medical branch with definite and seri-

ous obligations in the hospital organization. These obligations are quite different from those of oto-laryngology, which is properly regarded as a surgical specialty; for hospital purposes the two should constitute separate departments.

The duties of the ophthalmologist may be considered under two headings: the care of the sick and injured, and the education of students and colleagues in the broad relationships of ophthalmology.

1. The ophthalmic staff must care for patients assigned to their department. Some of these are surgical cases and adequate equipment must be available for ophthalmic surgery. This means instruments set apart for this department only, and handled by no one else. If a hospital is large enough to justify it, a special nurse in charge of ophthalmic surgery, or of ophthalmic and oto-laryngologic surgery, is useful; but it is sufficient to have a competent head nurse in the operating room and to have a degree of segregation of eye cases which will allow the nurses of a ward or pavilion to gain experience in the care of such patients.

Other cases, of more value to the hospital staff as a whole, are medical rather than surgical, being cases of ocular disease requiring study by various departments to determine the cause of the local disease. It is imperative that the ophthalmologist consider intraocular disease as secondary, and seek the help of his colleagues in the study of the patient. If these cases are seen only by the ophthalmologist they are neglected and the hospital staff is denied valuable experience.

Cooperation is a two-sided affair. Another large function of the ophthalmic department in a hospital is to assist in the diagnosis of cases not assigned to this department. Clinicians in other departments must recognize the value of ophthalmic examination in the diagnosis of a large variety of cases. Many medical cases, and most neurologic and neurosurgical cases, are entitled to this, and there is no department in the hospital which can altogether do without the assistance of the ophthalmologist. The daily use of the ophthalmoscope and perimeter should be part of the routine of the hospital, as much as the microscope or centrifuge. Living pathology, rarely obtainable elsewhere, is available in the eyes to a degree not yet understood by hospital staffs.

2. The ophthalmic department of a hospital has also an educational function. Internes must be taught to use the ophthalmoscope as a diagnostic instrument; they must also be taught the importance of the various observations which the ophthalmologist makes for the internist, neurologist, obstetrician, pediatrician, etc. The undergraduate medical course does not allow time for all this, and the interne year can be made more valuable by such continuation of the very elementary undergraduate instruction; bearing in mind always that the interne, like the medical student, is being trained as a doctor and not as a specialist.

The educational function of the department consists also in the training of its own members by means of clinical and laboratory research. The intensive study of problems arising in the routine work of the wards, both with strictly ophthalmic cases and other cases having ophthalmic aspects, will make better ophthalmologists. The isolation of the private office never fulfills this purpose adequately. Ophthalmic pathology can be pursued in the smallest hospital. One eye carefully hardened, sectioned, stained and mounted will furnish a dozen ophthalmologists with material for months of study and make them all better doctors for the study. A staff of several members should have one at least who makes a serious study of pathology; in time he may establish a scientific conscience in the hospital which will consider indifference to the fate of an enucleated eye as a disgrace.

To realize these obligations certain things are needful. A long-time service is essential. No proper care of patients or instruction of internes can be carried out with a rapidly altering personnel. A hospital service is worth having, or it is not. A few weeks on duty, and a longer period off, defeats every object of such service. Daily attendance upon the hospital is essential,

The idea that the ophthalmologist can be called in when somebody has an intraocular hemorrhage or a traumatic cataract, but is not needed in the absence of some such emergency, must be discarded. Recognition by other departments of the value of ophthalmic examinations is necessary if the ophthalmologist is to have a service worth his while and give help commensurate with the time he occupies in the hospital. He cannot force himself upon unwilling colleagues; but he can give invaluable help if he is allowed to see every case of headache, high blood pressure, nephritis, increased intracranial pressure, toxemia of pregnancy, meningitis and syphilis of the nervous system that enters the wards.

Considering the fact that the majority of eye cases are ambulatory, it is essential that facilities be provided in a hospital for an outpatient ophthalmic department. Without this, valuable material is lost and unnecessary expense entailed in caring for patients indoors who could report for treatment without having bed and board furnished. The outpatient department cares for the poor; it should be so manned and equipped as to give every service which the private office gives. Conscientious treatment of the ambulatory poor is a privilege which the ophthalmologist should value. This involves the utmost care of refraction cases. The poor can ill afford to waste money buying glasses which are hastily and carelessly prescribed; and such is the case unless the department is properly manned and a rigid discipline maintained.

Certain obligations of an ophthalmic department are illustrated best in a teaching hospital. All hospitals should be teaching hospitals; but those functioning as a part of a medical school are the best examples.

There must be a graded staff with a chief of staff in control, possessed of authority and willing to exercise authority. A democracy has no place in a medical school or hospital. Under the chief, should be the members of the department with rank and duties assigned. These duties should be of first concern, taking precedence over private work and office hours. The latter are legitimate interests and may honorably constitute the entire obligation assumed by the practitioner; but if teaching duties, in clinic and hospital, are undertaken for the very substantial educational value which lies in them, they should be fulfilled as a sacred obligation. The teaching of students in the ophthalmic department must be carried on with the regularity and thoroness exercised in an academic institution; the care of patients should be characterized by the same zeal shown in the private office.

The educational function of the department should extend to the staff itself, making the daily clinic a graduate school. Younger members of the department should be trained according to their previous experience and held to certain standards of excellence before gaining promotion. No sufficient thought has been given to this large function of a department of ophthalmology. The routine work of a clinic is often placed in the hands of any inexperienced man who will consent to attend, while the chief lectures and operates. The head of the ophthalmic department should be in daily attendance; he should personally supervise the work of the clinic; he should assign duties to his subordinates and see that they perform these duties. The refraction work should be done with all the thoroness practiced in the most painstaking office. Such an organization would furnish a steady supply of well trained ophthalmologists, working in harmony, satisfied with ophthalmology as a field large enough to occupy all their time. At present, the graduate study, usually inadequate, undertaken before locating for practice is apt to be the entire training of the ophthalmologist, followed by isolated office practice. This does not mean steadily increasing efficiency, or proper service to the public, to medical students, and to hospital patients. Every hospital staff should be a postgraduate faculty, insuring a continual growth of scientific medicine at home, along with the day's routine.

THE RELATION OF THE WEAKNESS OF THE EXTRAOCULAR MUSCLES AND DEPTH PERCEPTION.

WILLIAM F. BONNER, M. D.,

WILMINGTON, DELAWARE.

This is based upon studies of seventeen cases of early presbyopia and eighteen cases of muscular weakness with good vision. From these conclusions are drawn as to the relation of muscular weakness and depth perception. Presented before the College of Physicians of Philadelphia, Dec. 1923.

In preparing my paper, "Premature Presbyopia, which was presented before the Section on Ophthalmology of the American Medical Association at San Francisco last summer, measurements of depth perception were made on a collateral series of cases with weakness of the extraocular muscles, but who had normal near vision. The following facts were produced.

In patients with premature presbyopia:

1. Exophoria combined with good depth perception.

2. Esophoria combined with poor depth perception.

3. Orthophoria combined with good depth perception, except in cases of high latent hyperopia, where the depth perception was poor.

In patients with normal vision:

1a. As a rule exophoria combined with good depth perception.

b. Two cases with poor distant vision had both vision and depth perception improved by correcting lenses.

2a Low degrees of esophoria combined with good depth perception.

b. High degrees of esophoria combined with poor depth perception.

3. Right hyperphoria combined with poor depth perception, but hyperphoria and depth perception were improved by correcting lens and prism. The exceptions in cases, which had poor depth perception, were:

1. In premature presbyopia, the patient had pulmonary tuberculosis.

2. In the series with normal near vision, the patient had epilepsy.

Depth perception, or stereoscopic vision, was considered of great importance in the Air Service. Many pilots who made faulty landings were found to have defective stereoscopic vision.

In a paper by Lt. Col. L. H. Bauer and Major William MacLake, M. C., entitled "The Air Medical Service and the Flight Surgeon", attention was called to the defects in the hand stereoscope, which was used at first in the Air Service. This test was very unsatisfactory, because many with good stereoscopic vision could not acquire the knack of passing this subjective test. In order to make a study of the judgment of distance, Captain H. J. Howard modified a depth perception apparatus devised by Brooksbank James and described by him in his article, "Measurement of Stereoscopic Visual Acuity" in the Lancet, June 20, 1908, p. 1763. In the original article by Captain Howard, "A Test for the Judgment of Distance" published in the Air Service Information Circular, Mar. 15, 1920, tests were made of the applicant's ability to judge a 5 mm. space at 6 meters distance. 20 tests were made, if there were 5 failures, tests were made of a 10 mm. space. On failure with this space, 15 mm. was tried. The other spaces used if necessary, were 20, 30, 40, 50, 60, and 90 mm. Since then the apparatus has been fitted with pulleys and cords, so that new measurements are made of the applicant's ability to judge distance according to his approximation of a fixed and a movable post in the depth perception apparatus at a distance of six meters by means of the cords.

In preparing an examination for visual requirements for paid automobile drivers of Delaware, with the aid of Dr. James Thorington and suggestions from Dr. George Derby of Boston, a very elaborate examination was planned including acuity of vision, muscle tests, perimetric fields, color vision and depth perception. At last the requirements simmered down to acuity of vision and depth perception. In discussing this at the last meeting of the Air Service Medical Society, these two requirements were considered of the utmost importance by the ophthalmologist, physiologist and

psychologist on the staff of the School of Aviation Medicine.

In preparing my paper, "Premature Presbyopia," depth perception was taken routinely on seventeen patients. There were seven who had exophoria, six of these had depth perception of less than 30 mm. There were six cases of orthophoria; two of these with high latent hyperopia had poor depth perception: the other four had normal depth perception. There were two cases of esophoria with poor depth perception. One patient did not have intelligence enough to understand the test and another patient could not see the apparatus because of very high hyperopia.

A collateral series of eighteen cases with muscular weakness, but with normal near vision, had their depth perception taken. Ten of these had exophoria; eight had normal depth perception of less than 30 mm. One case of exophoria with depth perception of 54.6 mm. was unimproved by refraction. One case had 40.8 mm. of depth perception improved to 27.4 mm. by refraction. A patient with normal depth perception, 18.6 mm., and 4 degrees of exophoria had the depth perception improved to 6 mm. and the exophoria to 1½ degrees by correcting lenses. There were six cases of esophoria; four of low degree had normal depth. perception, but two with high esophoria had poor depth perception. One case of orthophoria was included in this series, because when first tested there was one degree of exophoria. He had normal depth perception. There was one case of right hyperphoria of four degrees, who had 90 mm. of depth perception. This was improved to one degree of hyperphoria and 55 mm. of depth perception by means of a plus 0.25 sphere and a one degree prism base down worn as a correction for the right eye. The left eye accepted a plus 0.25 sphere.

The patient with exophoria who had poor depth perception in the series of cases with premature presbyopia had chronic pulmonary tuberculosis arrested. The exception of exophoria combined with poor depth perception in the series of cases with normal near vision had epilepsy.

Conclusions. The main difference between the relation of the weakness of extraocular muscles and depth perception in cases of premature presbyopia and those with normal near vision is, that in cases of premature presbyopia, all who had esophoria had poor depth perception, while in cases of normal near vision, low degrees of esophoria combined with good depth perception and high degrees of esophoria combined with poor depth perception.

NOTES, CASES, INSTRUMENTS

PRIMARY SYPHILITIC LESION OF THE UPPER LID.

NOAH FOX, M.D., AND SAMUEL MACHLIS, M.D.

CHICAGO, ILL.

While numerous cases of chancres about the eyes have been reported in the past forty years, chancre of the upper lid comprises a very small minority of those found in the literature. G. F., the case herewith recorded, a colored man—26 years old, entered the Eye Service at Cook County Hospital April 19, 1924, complaining of a swelling of the right upper lid, with the following history:—

About eight weeks previous to entrance into the hospital, while fighting, he was bitten on the upper right lid. The wound was touched with iodin and after four or five days seemed to be entirely healed, except for a small crust which persisted for about seven weeks. Following this, the area beneath the crust broke down and began discharging a thin, blood stained fluid. Simultaneously, the lid became greatly swollen, so that the patient was unable to see out of that eye. He treated the lid with hot packs for about four days before seeking relief at the Cook County Hospital.

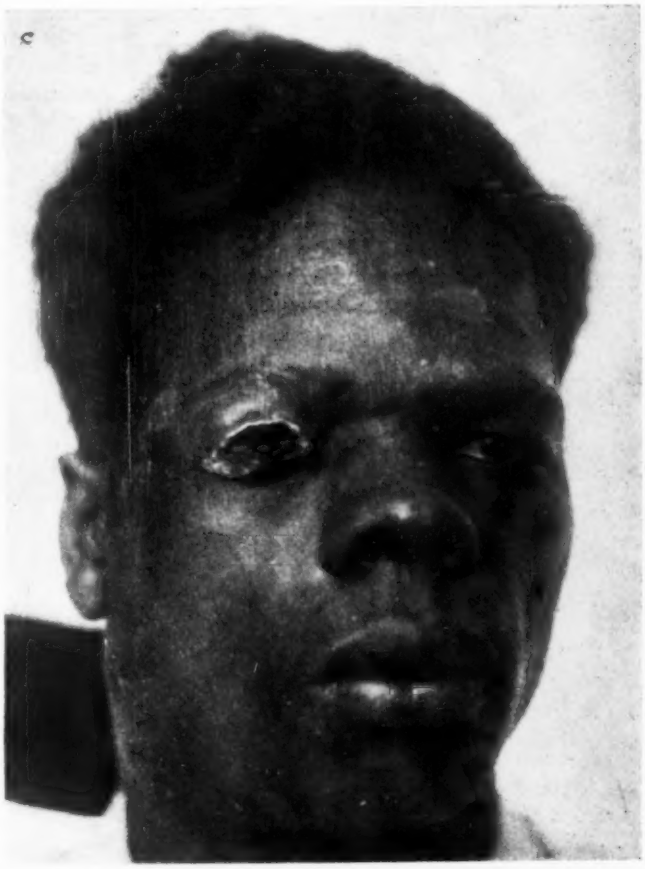

Fig. 1.—Case of primary syphilitic lesion of upper lid. (Fox and Machlis).

On entrance, the following essential pathology was noted:—the lid was enormously swollen, completely closing the palpebral fissure. In the middle one-third, at a point about 3 mm. above the lid margin, was an ulcer about 2½ cm. in diameter, with firm elevated, well circumscribed, crater like

border. The floor was covered with a dirty, pink-grey exudate, which, when removed, left a granular bleeding raw surface. On grasping the edges between the fingers it was found to be remarkably firm and painless. Both auricular and submaxillary glands on the right side were greatly enlarged. Blood Wassermann examination at this time was negative, remaining so until one week later. The patient was given six intravenous injections of 0.6 gms. each of neosalvarsan, over a period of three weeks, together with inunctions every other day of 1 gr. of bichlorid of mercury. The ulcer rapidly healed, the induration receded, and the glandular enlargement melted away.

A CILIUM THRU THE IRIS WITHOUT SYMPTOMS.

R. A. Hughes, M. D.

MONCTON, N. B.

Dr. Harry Gradle's case of a cilium in the anterior chamber, in the September, 1923, issue of this Journal, recalls to me a somewhat similar case,

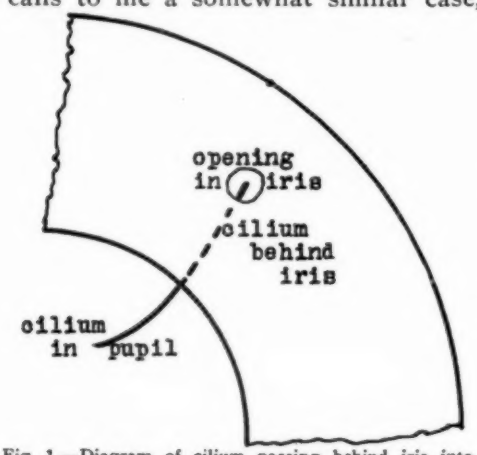

Fig. 1.—Diagram of cilium passing behind iris into pupil. (Hughes' case).

which perhaps is just as unique in the manner of its causation.

A Royal naval officer was examined by me in 1917. He came in only for refraction, but it was discovered that he had what appeared to be an eyelash in the eye.

Questioning revealed that while at school as a boy, he was holding a fountain pen in his right hand, resting his elbow on the desk and the pen on a level with his face and presumably pointing towards his eye. The pupil behind suddenly pushed his head, causing the pen point to enter the eyeball. That is all he knew.

The eye, aside from the cilium in it, showed no sign of injury, and there were no subjective symptoms. The cilium had its free end lying in the pupil, and the root end, after passing behind the pupil margin at one o'clock, was lodged in, or sticking thru a small hole in the iris near its attached edge. The cilium did not appear particularly discolored. There had apparently never been any reaction to its presence; nor did it cause any particular disturbance of vision. It had been there a number of years, and I think is sufficiently rare to justify reporting. Nothing, of course, was done with it.

NOTE ON NONSHATTERABLE GLASS.

Harry Friedenwald, M. D.,

BALTIMORE, MD.

A few years ago I learned thru Bowen and King of Baltimore, about an unshatterable glass which cracks under severe blows but will not scatter in fragments. I have used it in the case of many young children with strabismus, with a feeling of safety; when previously I so feared injury to the eyes from breaking glasses in falling, that I would often prefer to let the case go uncorrected for a long time.

It was only recently that I was informed that this glass is not generally known to the profession; this leads me to publish the note. The glass is made of two plates held together by a thin sheet of clear celluloid. The only fault lies in its gradually assuming an amber tint.

The plates are known as "Resistal Glass" and can be obtained by opticians from Strauss & Buegeleisen, 30 Front Street, Brooklyn, N. Y.

I do not know who suggested the idea. It has given me much satisfaction.

CONGENITAL DERMOID CYST OF CORNEA IN CONJUNCTION WITH DERMOLIPOMA.

I. M. MILLER, B.Sc., M.D.
YAKIMA, WASH.

It seems that only a limited number of these dermoid cysts have appeared in the literature.

Patient, female aged 17. When first seen had a dermoid cyst on the right eye. The nasal side of the tumor extended to the center of the pupil and the temporal side, well over on the sclera. The tumor was 8 by 12 mm. in diameter, containing five hairs. It was a pearl-gray color about 5 mm. thick, which prevented the patient from closing the eyelids. The left eye had no corneal deformity other than a slight opacity at the lower quadrant of the cornea and a small dermolipoma at outer canthus. The temporal side of both orbits contained a dermolipoma of the transition folds. They were both freely movable over the subjacent tissues and contained a great amount of fat. Neither of these were removed. The one on the right eye was the largest and seems to be increasing in size since the operation. They contained pores, out of which a colorless fluid is easily expressed.

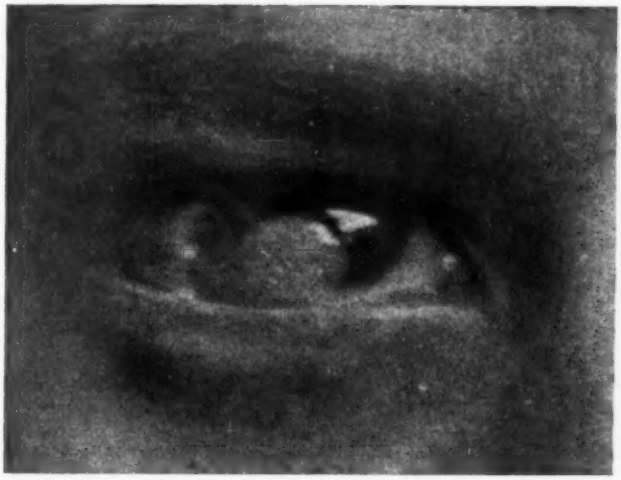

Fig. 1.—Congenital dermoid cyst with dermolipoma.

Operation. It seemed in this instance, we had two methods to choose from, namely: carbon dioxid snow pencil and surgical removal. The former was eliminated because of the impossibility of knowing how thick the tumor was, and the danger of sloughing into the chamber. The latter was chosen because it was deemed to be less hazardous.

After thoroly cocainizing the eye, the tumor was grasped by a pair of tissue forceps, and gently dissected from the sclera and the cornea by means of a curved scleral knife, such as is used in dissecting back the conjunctival flap previous to trephining. The main difficulty here to be encountered was the possibility of dissecting too deeply and opening directly into the eyeball. Our fears were not ungrounded, for it appeared that the base of the tumor was substituted for the conjunctiva, sclera and choroid coats of the eye. The tumor over the corneal portion seemed to extend thru the epithelial layer.

The amount of the tumor left corresponded approximately with the thickness of the coats of the eyeball We feared at first that we had dissected down too far and that there would be danger of hernia but such was not the case. The bulbar conjunctiva was dissected back for a short distance and then pulled over the scleral portion of the wound and se-

cured by three sutures, one above, one below and one at apex of wound; drawing the conjunctiva well up, covering the denuded area. A small tag of the tumor was left at the apex, in order to get sufficient anchorage for the suture. There has been an uneventful recovery, with improved vision in that eye.

OCCUPATIONAL ABDUCENS PARESIS.

CLARENCE E. IDE, M.D., F. A. C. S.
LONG BEACH, CALIF.

G. J. K., Court stenographer, age 33, came for relief of diplopia which had existed three days. In childhood had measles. History otherwise negative. Fine physical specimen.

Examination: Pupils dilated, but equal; react to light and distance; consensual pupillary reaction positive. Fundi normal. Vision R. 6/5; L. 6/5. Transillumination of sinuses and nasal examination negative. Blood pressure 120 syst. No heart lesion. Blood and spinal fluid Wassermann negative. Cell count, 4 cells per cu. mm. Butyric acid test negative with 2 c.c. of spinal fluid. Urinalysis: Sp. gr. 1028, acid, albumin negative, sugar negative. Sediment, mucus, and crystals.

Ruby lens test: Lens to R. Images of left field had 5 in. horizontal separation in upper, central, and lower levels, with red image slightly higher (1 to 2 in.), and to the right; images of center field showed horizontal separation of 14 in. in upper level, and 17 in. in central and lower levels. Right field showed separation 14 inches in upper levels, 18 inches in central and lower portion. This separation increased on looking to the right. Paresis of right external rectus.

Ruby lens to L. Left field showed images to have 8 in. separation (red image to right), center field had 18 in. separation (red to right). Right field had 2 ft. separation, (red to right). This separation increased on looking to the right.—Paresis of right external rectus.

In consultation next day Dr. T. J. Orbison expressed the opinion that the case was a peripheral occupational neurosis, and advised treatment with strychnia. R Strych. Sulph. gr. 1/30 4. i. d. On the 4th, 5th, and 6th following days galvanism and high frequency electricity were applied over left rectus. The eye excursions as taken with the tropometer were:

40	30
35 R. 40	50 L. 40
38	50

showing weak abduction and deorsumduction of R. The same day ruby lens test showed in left field a separation of 10 in. in upper level, 4 in. in central level, and 14 in. lower level. Right field showed separation of 4 ft., 3 ft., and 4 ft. Two days later R. abducted to external canthus. Two weeks later on extreme abduction to R. there was still a separation of 6 in. in the three levels. There was ultimate recovery after a fishing trip for rest.

In view of all investigations made in this case the conclusion was reached that the weakness of the abducens resulted from constant typewriting, the notes being placed to the right and the eye kept on the notes, the man using the touch method of writing.

MESENTERY THROMBOSIS AND DEATH FOLLOWING CATARACT EXTRACTION.

ARTHUR CURTIS JONES, M.D., AND CECIL PRATT CLARK, M.D.
BOISE, IDAHO.

The following case is reported because of the unusual complications, resulting in death:

Thrombosis of the mesenteric bloodvessels does occur rarely after abdominal operations, but we have been unable to find a report of such a complication following extraction of cataract.

Mrs. S., white, age fifty, first seen May 24, 1923, complaining of inability to see with right eye. Stated she had gradually been losing vision in the right eye for the past four years and during past year her vision in left eye was becoming impaired. Father died at age of 76; mother, age 76, liv-

ing and well. No family history of cataract. Patient came West in early life for a chest condition, supposedly pulmonary tuberculosis.

Examination: Vision R. Hand movement 1 ft. L. 20/70. Ocular appendages healthy. Cornea clear. Irides healthy. Pupils small. React properly to light. Dilating the pupils showed mature senile cortical cataract R., with immature cataract L.

The patient was fairly well nourished and gave the appearance of being in good health. She was 5 ft. 10 inches tall, weighed 110 pounds, being somewhat under weight. Examination of the heart and chest disclosed no pathology. A urine examination showed specific gravity 1020, acid reaction, 52 grams total solids per 1000 C.C., negative for albumin, sugar, acetone, diacetic acid and indican. A microscopic examination showed a few epithelial cells.

The patient was advised to have removal of the cataract in R. The next morning the operation was done at the hospital under local anesthesia. Thirty minutes before operating 1/4 grain morphin sulphat, with 1/100 of a grain scopolamin hydrobromid, was given hypodermically. The orbicularis oculi was injected with novocain 2%, according to Van Lint procedure. Silver nitrat, 1%, gtt. 1, was used in the eye for prophylaxis. Under butyn 2%, adrenalin anesthesia the usual combined operation was performed. The cataract was delivered and eye closed without any accident or complication.

The patient was kept quietly in bed, with both eyes bandaged. She was comfortable until the next day, when at 3:00 P. M. she became nauseated and vomited. During the next two hours she vomited several times and complained of pain in her abdomen and back. Pads had previously been put in place to support her back. The evening of the first postoperative day the patient was semidelirious. During the night there was considerable vomiting and passing of flatus. The abdomen was distended and tympanitic. Turpentine stoops were applied and warm enema given, but no relief was obtained. The entire abdomen was very tender. Pituitrin was used, but failed to relieve the condition.

Drs. Stewart and Stone saw the case in consultation. No definite diagnosis could be made. The pulse became progressively weaker and death occurred May 28.

Permission was obtained to oper the abdomen, which was done the same day.

The superior mesenteric artery was found to contain a thrombus which measured one-half inch in diameter and two inches long. The corresponding bowel area was gangrenous. The Fallopian tubes were patent and the uterus had never contained a fetus. No other abdominal pathology was found.

Thrombosis of an abdominal artery following a cataract operation is an abnormal complication and reminds us ever to be watchful of the many complications that may follow an intraocular operation.

SOCIETY PROCEEDINGS

Reports for this department should be sent at the earliest date practicable to Dr. Harry S. Gradle, 22 E. Washington St., Chicago, Illinois. These reports should present briefly scientific papers and discussions, include date of the meeting and should be signed by the Reporter or Secretary. Complete papers should not be included in such reports; but should be promptly sent to the Editor, as read before the Society.

ROYAL SOCIETY OF MEDICINE LONDON.

Section of Ophthalmology.

Meeting of June 13th, 1924. President, Mr. A. L. WHITEHEAD (Leeds).

Peripheral Spots in Retina.

MR. WILLIAMSON NOBLE showed a patient for diagnosis with numerous yellowish white dots in the fundus. When first seen, the appearance suggested that the case was one of *retinitis punctata albescens.* The peripheral part of the fundi was slightly albinotic, and here some of the retinal pigment could be made out; but the change was not more marked than that frequently seen in the periphery of an ordinary albinotic fundus. The fields of vision were full, there was no night blindness, and the vision in each eye, with correction and a dilated pupil, was 6/9 full. It therefore seemed unlikely that the condition could be retinitis punctata albescens.

A possibility was that the condition might be due to multiple *colloid excrescences* of the membrane of Bruch. The late George Coats published such a case in the Transactions of the Ophthalmological Society, Vol. XXXI, in which the ophthalmoscopic findings were verified by subsequent pathologic examination. Mr. Coats described the affected areas as having a flat scaly appearance, which showed a distinct glitter on movement of the light, and seemed to be a little raised above the level of the fundus.

The patient, when first seen, had been suffering from bilateral glaucoma for nine months, and the vision in the right eye was reduced to perception of fingers at 3 feet, and in the left eye to perception of light. The appearances did not, except superficially, resemble those in the present case; in the latter the dots were much smaller, did not glitter, and did not seem to be raised above the general level of the fundus. Mr. Eason saw this present case in 1912, but that gentleman had no record of any abnormality of the fundus, tho he remarked that such evidence was of only negative value.

To sum up, this was a case of symmetric change in the two fundi, consisting of numerous yellowish-white dots in the midperipheral zone, producing no symptoms. The patient had a negative Wassermann, and the urine was normal. Mr. Williamson Noble said he did not see how such an extensive change could be inflammatory and yet produce no loss of vision, and he suggested, as a possible explanation, that the dots represented small localized bosses of the retinal pigment epithelium, a sort of negative freckling. He expressed his thanks to Mr. Oliver for seeing the case when he himself was away from the hospital.

Discussion. DR. RAYNER D. BATTEN showed illustrations of two cases having a similar appearance, in which also there was no visual defect. One had been under observation 20 years, without any material change occurring, and there was nothing present pointing to inflammation.

MR. MALCOLM HEPBURN said he thought these cases were generally hyalin degenerations of the membrane of Bruch. As a rule, the degeneration areas were surrounded by a small aureole of pigment; he did not see much of the latter in the present case, but that did not necessarily militate against the diagnosis he had suggested.

THE PRESIDENT said his feeling was that they were degenerative changes of a congenital character.

Modification of Elliot's Scotometer.

MR. FRANK JULER exhibited a modification of Elliot's scotometer which he had devised. He expressed much admiration for the original instrument, the chief drawback of which was that it needed an assistant to the observer to help in the recording of the readings, as the indicator was at the back

of the instrument. He got Messrs. Weiss to fix a rim around the edge of the rotary screen, marked by angular degrees so that the markings could be seen from the front. This constituted a one-man instrument.

Discussion. MR. R. PICKARD (of Exeter) described a method he had used; and which required none but the observer to employ. He had a canvas screen painted in dead black, and tangent circles, also in black, raised somewhat above the general surface, which enabled them to be read. He could take his readings with this rapidly and accurately.

Relations Between Subarachnoid and Intraocular Hemorrhage.

DR. GEORGE RIDDOCH and MR. CHARLES GOULDEN collaborated in an exhaustive treatment of this subject.

Dr. Riddoch said the not infrequent occurrence of hemorrhage into the subarachnoid space within the skull had long been known, but mainly as a cause of death in cases in which an incorrect diagnosis had been made during life. No distinctive symptomatology had been associated with it, hence it was regarded as unrecognizable at the bedside, and its outcome was regarded as fatal. But it had been found that the presence of blood on lumbar puncture indicated bleeding into the subarachnoid space.

Etiologically, there were three main groups of cases: (1) Those with traumatic rupture of meningeal vessels; (2) Cases of bleeding into the subarachnoid space secondary to intracranial hemorrhage; (3) Cases of primary nontraumatic rupture of a meningeal vessel or aneurysm. The third group was the most interesting, and knowledge of this had been much added to by Symonds; so that it could now be diagnosed with reasonable certainty without the aid of lumbar puncture. Cases of it were often of an age when intracerebral hemorrhage was not very common. In the present authors' series the ages were 43, 44, 46 and 53. Several authorities attributed the lesion to rupture of a congenital aneurysm of one of the basal arteries. Arterial hypertension was often absent from these cases. A frequent feature of such hemorrhage was bleeding into one or both eyes. One of the four patients here reported died, and an eye was removed and examined histologically with the object of ascertaining by what means the intraocular hemorrhage occurred. The contributions dealt with this case specially.

The man was aged 44, and he was admitted to London Hospital last February, under Mr. Russell Howard. His previous health had been good, except that he probably had sunstroke while in Palestine. While going upstairs he suddenly fell down, but did not lose consciousness and walked up to his room. A little later he was heard to fall and was found unconscious. He had three successive fits at short intervals, foaming at the mouth; he was convulsed and cyanosed. In the second fit, opisthotonos occurred.

He was admitted to London Hospital in a state of "cerebral irritation;" he resented examination or questioning. His pupils were of medium size, equal, and reacted to light and to accommodation; ocular movements were full. All tendon jerks were exaggerated, and the plantar response was extensor on both sides. Sensation seemed good. Blood pressure readings were 140-80; temperature 97° F., pulse 100, full and strong; respiration 24. Three days later his muscles were flaccid, his tendon jerks were difficult to evoke, but the plantar reflexes were normal. Three days later still he had diplopia on looking to the right, and his tendon reflexes were absent. In a day or two the diplopia disappeared, but otherwise there was no change. A few days later he had difficulty in swallowing, and was very drowsy, the left side of his face was weak, and his tongue was protruded to the left. No tendon jerks could be obtained, and, for the first time, there was incontinence of urine. The blood pressure was 140 — 90.

Twelve days after admission he was stuporous and cyanosed, the breathing stertorous, at 34 per minute, pulse 114, temperature 102° F. Both fundi showed hemorrhages in the neighbor-

hood of the discs, and the latter were swollen. The left fundus showed two large crescentic hemorrhages along the inferior veins near the disc margin. The pupils were equal, and reacted well to light; there was a flaccid left hemiplegia. The heart's apex beat could not be felt, and his noisy breathing prevented the heart sounds being heard. The base of each lung was congested. The lumbar fluid was pink, and contained blood and a slight excess of lymphocytes. Wassermann was negative. He died on the 13th day of his illness, with a temperature of 104.2, pulse 132, and respiration 62.

Red-brown blood and a small blood clot, together a few drachms of fluid, were found in the subdural space, and in the posterior part of the longitudinal fissure were two symmetric areas of subarachnoid hemorrhage; other collections of blood were scattered over the cerebral convexities, and much red and brown blood clot lay under the arachnoid in the right Sylvian fissure, and a smaller amount in the left Sylvian fissure, anterior part of the median fissure and cisterna basalis. A saccular aneurysm, 1 cm. in diameter, projected backwards from the right intracranial carotid at the origin of the right middle cerebral, and it had been ruptured at its inner pole. Within the orbits the sheaths of the optic nerves were distended with blood. When the right eyeball was opened, multiple hemorrhages were seen round the margin of the optic discs, the two largest lying on vessels. Purulent bronchitis and bronchopneumonia were in the lungs. There was only moderate atheroma, but the left kidney was grossly atrophied and fibrotic, and its pelvis was cystic and projected inwards. There was no abnormality of renal vessels.

Discussing the clinical picture of rupture of a basal aneurysm, he said the patient, in many cases, had been said to have good health until the attack, but careful enquiry showed there had been headache, giddiness, defective memory for recent events, etc., also there was usually tinnitus with periodic exacerbations. One of the four patients now dealt with had had periodic attacks of epistaxis, the bleeding having been preceded by lethargy and yawning, with a sensation of heat on the vertex. On the epistaxis commencing he felt very much better and the symptoms disappeared. The onset of the seizure was always sudden. Usually the bursting of the aneurysm synchronized with some form of activity, which for the time raised the blood pressure. The coma into which the patient passed might rapidly become profound, all the signs of cerebral and medullary compression appeared, and he might die within a short time.

More characteristic, however, was the clinical picture that, apart from the onset, resembled that of meningitis. Signs of local disturbance of neural function were always present, but, usually, slight. Frequently there were bilateral signs of pyramidal disturbance, such as diminished abdominal reflexes, increased tendon jerks, and an extensor plantar response. An almost constant sign was rigidity of the neck, and Kernig's sign was often positive on both sides. An invariable sign of great importance was the presence of blood in the spinal fluid.

With regard to the course of the complaint, recovery from at least the first seizure was common; after two or three weeks there was a return of consciousness, any palsies disappeared, and the reflexes became normal. Sometimes, however, the slight mental defects, such as unreliable memory, remained. But when vitreous or subhyaloid hemorrhage had occurred, vision seemed to be more or less permanently impaired. One of the cases now narrated had had at least four seizures in 3½ years, and was still alive.

Mr. Goulden first entered into a reminder of the intimate anatomy of the parts concerned. With regard to the central vessels of the retina, a branch of the ophthalmic artery pierced the nerve on its infero-medial surface about 10 mm. from the sclera. It ran for a short distance upon the deep

surface of the pial sheath, and gradually reached the center of the nerve, accompanied by the central vein carrying with it a prolongation of the pial sheath. The central vein had the same relations as the central artery, and sometimes opened into the superior ophthalmic vein, tho more often directly into the cavernous sinus.

The optic nerve, its fibers having lost their myelin sheaths and being correspondingly reduced in volume, pierced the sclera by many perforations, the lamina cribrosa, becoming continuous with the retina. At this point the dural sheath bent outwards at an angle of 110° and became continuous with the outer layers of the sclera so intimately that no line of separation was visible. The arachnoid sheath also became continuous with the sclera, the subdural space ending in a cul-de-sac. Likewise the pial sheath, when it reached the sclera, turned outwards and became continuous with the inner layers of the fibers of the sclera; the most internal of the fibers entered into relation with the choroid. He showed a number of instructive slides illustrative of this portion of the thesis.

When considering the ophthalmoscopic signs in cases of hemorrhage into the optic nerve sheath, they must not be confounded with those changes which resulted from injury to the optic nerve due to fracture at the base of the skull, in the neighborhood of the optic foramen and effusion of blood into the nerve sheath. The cases here discussed were those in which there was no direct injury to the optic nerve, by any such object as a spicule of broken bone, or any damage to the nerve by a sudden strain or crush.

In all the cases which had been followed by a pathologic examination the appearances were so similar that a characteristic clinical picture of the fundus could be described. The most common abnormality was papilledema. It was usually bilateral, corresponding to hemorrhage into both nerve sheaths. It was of remarkably rapid onset; Uhthoff said he had seen it develop in half an hour, and to be well marked in five hours. The veins were always engorged and tortuous. In most of the cases there were hemorrhages into the retina, usually small and often near the disc. Vitreous hemorrhages were said to be rare in the condition, but they occurred in three of the four cases now reported. Disease of the retinal vessels had not been noted in the cases recorded, and in these four cases these vessels seemed healthy.

Ophthalmic symptoms were not associated with the cases recorded nor with these four, tho this was not remarkable as the patient was overcome by unconsciousness, whether the cause of the subarachnoid hemorrhage was spontaneous or traumatic. On recovery from the unconsciousness, the patient complained of defective sight; which was great when the vitreous had been full of blood. The sheath of the nerve, in these cases, was found to be tensely filled with blood clot, which caused the sheath to have the appearance of a distended vein.

He reported the result of a microscopic examination of longitudinal sections of the eye. Under a low power, the optic nerve sheath was found to be distended with blood clot, which was most obvious at the anterior extremity of the nerve, where was an ampulliform dilatation of the sheath. A higher power showed there was no infiltration of the nerve itself with blood, but that the blood clot was exactly delimited by the pial sheath. The sclera was not infiltrated with blood, and no corpuscles could be found surrounding the vessels within the nerve. The papilla was slightly swollen. Retinal hemorrhages could be seen at a considerable distance from the papilla. In transverse sections of the nerve the subarachnoid space was found filled with blood. But the blood did not pass into the pial sheath, and no signs of hemorrhage could be found within the nerve. The central vessels within the subarachnoid space were full of blood, but it did not pass into the pial sheath.

How, he asked, could the simultaneous appearance of a subarachnoid hemorrhage be connected with hemor-

rhage into the retina or vitreous and the appearance, within a short time, of papilledema? The suggestion could be dismissed that blood found its way into the eye by piercing the pial sheath of the nerve and in that way passing thru the lamina cribrosa into the eye. And it must be remembered that retinal hemorrhages in these cases were not necessarily at, or even near, the disc. The ophthalmoscopic appearances conformed very much with the prevalent ideas as to venous engorgement of the retina, which was seen in its most marked instance in cases of thrombosis of the central vein of the retina, namely, papilledema, enlarged veins and retinal hemorrhages.

As papilledema occurred so soon, it was obvious that something had occurred within the optic nerve sheath at least soon after the subarachnoid hemorrhage, and that was assuredly a distention of the sheath of the nerve with blood. Dupuy-Dutemps, Holmes and Paton had shown that when the optic nerve sheath was distended, in cases of raised intracranial pressure with papilledema, the lumen of the vein in the subarachnoid space of the nerve was flattened and thus much narrowed. Deutschmann had produced the exact appearance of papilledema in an animal by the direct injection of agar-agar into the optic nerve sheath, thereby causing a prolonged compression of the central vein of the retina in the subarachnoid space. Thus the cause of the trouble seemed to be interference with the venous return from the retina and optic nerve.

Discussion. MR. LESLIE PATON said that not in all cases of the kind under discussion had papilledema appeared in a few hours. Sometimes it did not occur until several days after the onset of the condition. In his paper recently read at the Glasgow meeting of the Ophthalmological Society he called attention to a third type, in which papilledema did not occur until some months after the hemorrhage; it was the encysted form of hemorrhage, the hematoma acting as a tumor in this respect.

As to the origin of the subhyaloid hemorrhages in these cases, he agreed with Mr. Goulden that many of the hemorrhages in the eye, in these patients, were of the type which could be seen in any form of papilledema. But there were extraordinary cases with a huge subhyaloid hemorrhage without any distention of veins at all, and when the hemorrhage had sufficiently subsided to allow the disc to be seen again, there were no signs of papilledema. That seemed to strongly suggest there must be some direct continuity of hemorrhage from the sheath into the subhyaloid tissues.

Dr. Riddoch and Mr. Goulden very briefly replied.

H. DICKINSON.

HOUSTON OPHTHALMOLOGICAL AND OTOLARYNGOLOGICAL ASSOCIATION.

June 3d, 1924.

DR. W. LAPAT, presiding.

Recurrent Ulcerative Keratitis.

DR. E. L. GOAR presented a man, about 55 years of age, with a stubborn, recurrent ulcerative keratitis, on the upper inner quarter of the cornea; the cornea from the ulcer to the limbus was thickly vascularized.

Discussion. DR. L. DAILY suggested that it might be tubercular, and advised the use of tuberculin.

Syphilitic Chorioretinitis.

Dr. R. K. Daily presented a woman, 63 years of age, who had come complaining of poor vision; her vision in the right eye was fingers at two feet, and left light perception. She could not tell intelligently when her vision began to fail, or how long it had been so poor. Her field of vision for white in the right eye was between 20 and 30 degrees, with two reentering angles touching the 10 degree line. She had old posterior synechiae. The lenses had fine dot like opacities in the anterior portion, and a heavy golden opacity (with slit lamp) posteriorly. The entire fundus showed large degenerated areas with heavy pigmentation. Detailed study is impossible because of the lenticular opacity. Urinalysis was negative, and Wassermann plus 3. She was given salvarsan and

potassium iodid; 19 days after the first injection, her vision in the right eye was 20/200, and the field for white doubled. Another week later, vision was 20/100. The left remained unimproved.

Healed Perforating Wound of the Cornea.

DR. E. M. ARNOLD presented a patient, about fifty years of age, who came a month after he had a perforating wound in the cornea; at that time the cornea was bulging, and the lens was in the anterior chamber. Dr. A. made a linear incision into the anterior chamber and expressed as much of the lens as he could. Now there is a large flat leucoma, out and up. He has light and movement perception.

Discussion. DR. H. HADEN congratulated Dr. Arnold, on the unusual result, because it is very rare for a cornea to flatten down.

Folliculosis.

DR. W. STROZIER presented a child seven years old, with a very marked follicular hypertrophy of the conjunctiva of all the eyelids. The case was of two years' standing, and there was no corneal involvement. Dr. Strozier thought the diagnosis of trachoma doubtful.

Discussion. DR. ARNOLD thought that this is unquestionably trachoma.

DR. SLATAPER said in these cases he liked to make a smear for eosinophilia for vernal catarrh for differential diagnosis.

DR. L. DAILY. It would be interesting to make an epithelial Giemsa stained smear and search for the trachoma bodies.

Atrophied Eyeball.

DR. L. PULLIAM exhibited an eyeball, which he enucleated from a girl seventeen years of age. When five years old she had typhoid fever, and since then her eyeball became small, and she lost sight in that eye. The eyeball was removed as a possible source of irritation to the good eye. It was small, shrunken, hard, the cornea was opaque, and when opened it contained a large lens, calcified to a rock like consistency, and a retina detached thru a cyclitic membrane.

Psychoneurosis and Ophthalmology.

The paper of the evening was read by DR. E. B. APPLEBEE, by invitation.

RAY K. DAILY, Secretary.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

SECTION ON OPHTHALMOLOGY.

February 21, 1924.

DR. T. B. HOLLOWAY, Chairman.

Congenital Papilloma of Eyelids.

DR. MARY BUCHANAN presented the case of an infant, aged six weeks, with a tumor like a soft mole, protruding from between the lids, attached to the skin at the outer canthus of the right eye. It was about 0.5 cm. in diameter and covered the skin. Except at the canthus, it was free from the lids and attached by a long pedicle extending upward to above the tarsal plate. Whether it extended into the orbit was a question it was impossible to decide without some surgical procedure.

Discussion. DR. LUTHER C. PETER suggested that the best method of procedure would be to give the child chloroform in order to make as thoro a study as possible of the extent of the cyst. If it is attached to the lid only, it could be removed without difficulty; if it extended well back into the orbit, as in many cysts of this character, the operation might be too formidable to undertake at this early age, and could be safely postponed until the child was about six months of age.

DR. WILLIAM ZENTMAYER said that he had not seen previously a case in which so much of the dermoid was extraorbital. He presumed the pedunculated appearance was due to constriction by pressure on the lids at the external commissure.

Operative Results in Cicatricial Ectropion.

DR. WILLIAM ZENTMAYER presented a colored man, aged 30 years, who came to the Wills Hospital because of a cicatricial ectropion due to a wound which extended from the cheek thru the lid into the floor of the orbit. The

eye had been removed because of the injury. It was impossible to insert an artificial eye. An effort was made to correct the ectropion, feeling that this alone would accomplish the desired end.

There was a bridle of conjunctiva stretched across a shallow cul-de-sac at the site of the wound. This was treated by the Berens procedure, with some improvement. The operation for the ectropion was practically one that was devised by Imre for the correction of similar conditions resulting from war injuries. The upper part of the scar was excised by four incisions which left a diamond shaped wound. From the horizontal angles of this diamond, incisions were made laterally to the margin of the lid as far as both canthi. By uniting the raw edges of the two flaps the lower lid was reconstructed. The skin below and to the outer side of the diamond was freely undermined, and this flap was drawn over and united to the other side of the diamond. In excising the scar the wound was carried into the orbit and a suture inserted to close the incision. The result was satisfactory, the patient easily wears an artificial eye, and the line of the lid is perfect.

Traumatic Enophthalmos.

Dr. William Zentmayer said that the patient, a farmer, aged 35 years, on December 21, 1923, while assisting in an operation on a calf, was kicked in the right eye. He was seen about an hour after the accident. The lower lid was torn from the inner angle just mesial to the punctum along the inferior orbital margin, about two-thirds of its length. The cartilage in the upper lid was ruptured vertically to the inner side of the middle of the lid. The skin wound was about 3 mm. long, and there was a subconjunctival hemorrhage. About ten stitches were inserted. The next day the patient complained of diplopia, and about a week later examination showed paresis of the inferior oblique and the four recti muscles.

On February 13th, it was noted that there was a contraction of the frontalis on the right side with marked arching of the brow, and an enophthalmus of about 4 mm. Confidence in the diagnosis of fracture of the orbit led to postponing an X-ray of the orbit until February 17th. Dr. Henry B. Pancoast reported no evidence of fracture, but said that he feared the X-ray was made at too long an interval after the injury to show a linear fracture which might have been detected at the time of the accident.

The case is of value for its bearing upon the pathogenesis of enophthalmus. There seems to be no other way to explain the involvement of the third and sixth nerves than by a fracture thru the sphenoid fissure, altho this in no way invalidates such a theory as has been advanced by Dr. Shoemaker to explain this symptom.

Traumatic Detachment of the Choroid.

Dr. William Zentmayer also exhibited an iron worker, aged 37 years, who, on January 18, 1924, was struck in the right eye by a drift pin. Examination five hours later showed a large iridodialysis, extending from 11 to 9 o'clock; pupil partly dilated; hyphemia; lens in situ; form field apparently full; vision 1/60. Three days later there was marked ciliary injection, pupil straight-edged up and out, and apparently a choroidal detachment over the nasal portion of the fundus, well forward and extending upward to about the equator, probably due to a subchoroidal hemorrhage. Field contracted above and on the nasal side. Vision with correction, 20/70. The eyeball was soft. There was an enophthalmus of about 2 mm. and the disc was pale with the upper inner border slightly prominent. Over the area in which the choroid was detached there was marked sclerosis of the choroidal vessels with considerable intravascular pigmentation, and haze of the overlying retina. This disturbance reached from just anterior to the equator almost to the border of the disc. At the macula there was a more superficial disturbance in the choroid. The field taken recently shows marked concentric contraction.

The two particularly interesting features are the detachment of the chor-

oid and the marked variations in the refraction. On January 21st, sph.—2⊃cyl.—1 ax. 90 deg.=20/20; on the 30th, sph.+1⊃cyl.+2.50 ax. 95 deg.=5/20; on February 5th, sph.+0.25⊃—1 ax. 30 degs.=20/40 pt.; on the 8th, cyl.+1 ax. 105 deg.=20/30 pt.; on the 21st, sph.—0.50⊃cyl.—0.75 ax. 30 deg.=15/30.

The eye was under atropin up until February 8th. It is evident that there was paresis of accommodation, as with a sphere +4 with the correction glass, the near point was 20 cm. Other interesting features are, of course, the iridodialysis and the beginning enophthalmus. As yet the patient is not neurasthenic, and seems to assist in every way in the tests. He, however, complains of not seeing well to the outer side of the affected eye.

Discussion. Dr. Adler inquired if the change in the correcting glass accepted from time to time was due to the actual changes in the dioptric properties of the eye, or whether the patient was allowed to choose the glass; also if retinoscopic examination has been made and the changes verified as being due to actual changes in the refraction?

In reply, Dr. Zentmayer said that the refraction tests had been made subjectively, and he supposed the variations to be due to changes which occurred in the level of the retina, with alterations in the subchoroidal exudate, and to variations in the action of the ciliary muscle, which appeared to be but partially paralyzed.

Case of von Hippel's Disease.

Dr. J. Milton Griscom reported the case of a man, aged twenty-six years, whose medical history and present physical examination were negative in all respects. His right eye had been blind since early childhood, and subsequent enucleation confirmed the clinical diagnosis of chronic choroiditis, made at the time of his admission to the Wills Hospital.

In the left eye the vision was 1/20, corrected to 1/10. The anterior segment, the lens and vitreous were normal. The region of the disc was covered by a band of grayish exudate which began about 4 d.d. from the disc up and in, and ran an equal distance to the temporal side and somewhat downward. In this exudate were dilated vessels and others small and degenerated. The lower half of the fundus was occupied by a large detachment of the retina together with enormously dilated arteries and irregular patches of exudate, which became more dense in the periphery. On the temporal side was a flat irregular area of exudate with several small spots of hemorrhage near its border. In the upper part of the fundus, projecting into the vitreous about 3 diopters, was a cone shaped whitish mass ½ d.d., capped with a reddish nodule. The vessels which ran into the base of this cone were somewhat enlarged but the remaining vessels in the upper one-third of the fundus were small. The case was considered one of true angiomatosis of the retina of the type first clearly described by von Hippel.

Discussion. Dr. Posey said he considered the case one of von Hippel's disease, the diagnosis being made by the distended appearance of the vessels, the retinal detachment, and the characteristic vascular dilatations.

Rupture of Iris Followed by Neuroretinitis.

Dr. Frederick Krauss presented a case of neuroretinitis, with rupture of the iris, in a boy aged 15 years, caused by a large bird shot striking the left eye near the corneoscleral junction on the temporal side. There was no penetration, but a small hyphemia. Fundus examination showed disc edges hazy with some fullness of the veins; no hemorrhages. The X-ray was negative. After the absorption of the hyphemia a long rupture of the iris near the ciliary border was seen, the edges of the torn iris irregular in outline and the root of the iris plainly seen. The pupil remained dilated with a straight edge on the side of the rupture. The lens showed a crescentic shaped area, extending from above downward, consisting of fine pin point opacities similar to those seen in the well known Vossius ring.

One week later, the optic nervehead was swollen about 4 D., with edema extending into the retina. The veins were enormously engorged with hemorrhages on the nasal side below. This swelling has been gradually disappearing, and vision improved from 5/30 to 5/10, with nearly full visual field.

Discussion. DR. POSEY said he had recently seen an unusual accident from a B-B shot, the bullet fired from a slight elevation at a distance of fifty feet, striking the eyeball and lodging in the inferior cul-de-sac, whence it was easily removed by slightly everting the lower lid. The eyeball itself had escaped injury with the exception of a rupture of the choroid and injury to the overlying retina.

DR. T. A. O'BRIEN stated that he had two cases of gun shot wound of the eye, the first with no pathology except a subconjunctival hemorrhage, the shot being found in the cul-de-sac; the second with penetration of the globe at twelve o'clock back of the limbus with a detachment of retina and retinal hemorrhages. The shot lodged retrobulbar, as verified by X-ray.

DR. KRAUSS said that it was interesting that the several cases mentioned which were struck with a B-B shot exhibited no penetrating wounds, but the injuries all resulted from concussion. He had seen four eyes which had been struck with such missiles, and none of which had penetrated; he considered penetration unusual.

DR. ZENTMAYER asked whether the iridocyclitis was severe enough to explain the papillitis, it being a common observation that inflammation in the anterior segment of the eye is often accompanied by involvement of the optic nerve.

DR. MCCLUNEY RADCLIFFE reported a case where a buckshot thrown by a slingshot from a distance of fifty feet, penetrated the eyeball with little or no loss of vitreous. The case was seen several weeks after the accident, at which time the eyeball was enucleated.

Bilateral Metastatic Ophthalmitis.

DR. T. A. O'BRIEN presented the case of a retired locomotive engineer, aged sixty-nine years, who in November, 1923, while reading a newspaper, experienced sudden pain in the right eye with impairment of vision, followed in the evening by a similar attack in the left eye. Within twenty-four hours vision was reduced to light perception in each eye. Examination of the right eye revealed a soft boggy edema of the lids, extending to the maxillary prominence of the cheek; conjunctiva reddened and chemotic; orbital chamber shallow; aqueous cloudy and hypopyon below; iris swollen and discolored with indistinct surface markings. Pupil 3 mm., fixed and slightly irregular, with strings of light brownish exudate in the pupillary area. Fundus invisible. Tension +. The left eye exhibited similar signs, except that the chemosis was not as marked, and a few precipitates were observed on the posterior surface of the cornea.

Examination revealed pyorrhea and many abscessed teeth, which were promptly treated; deflected septum on the right side, with hypertrophy of the left middle turbinate, which obstructed drainage and aeration of the frontal sinus; pus in the frontal sinus, which was removed intranasally; anterior ethmoids were drained, but washings from maxillary sinuses were found clear; left tonsil showed a small amount of pus. Under appropriate local and general treatment the condition of the eyes improved slightly, with moderate appreciation of vision, but against the advice of the staff, the patient left the hospital seven days following admission, and died one week later from meningitis probably of metastatic origin.

Discussion. DR. LUTHER C. PETER stated that in the last epidemic of influenza he had the opportunity of observing two cases of metastatic ophthalmia, both unilateral. In each the eye was totally lost, as the metastatic condition went to suppuration. In the first case, the intraocular abscess was well walled off. Three stabs of the eyeball were made before the abscessed cavity was reached. During that same epidemic, and at about the same time, a case of acute glaucoma was observed, precipitated by an attack of influenza.

It appeared on the fifth day of the disease. An iridectomy was necessary. One year later, the same patient developed acute glaucoma in the other eye at the height of a second attack, of influenza, for which an iridectomy was required.

Embolism of Central Artery of Retina During Chorea.

DR. H. MAXWELL LANGDON exhibited a school girl, aged 11 years, with choking of the central artery of the retina. He said that undoubtedly cases were so rare, and the underlying series of events which made for the production of the embolus so unusual, that it seemed worth while to report the case. Of all cases which had been reported up to about 1912, Mr. Coats on pathologic examination would accept as authentic but five cases, placing the others all in the class of thrombus formation. Harms felt that for a case to be accepted as embolic in etiology, the vessels should be practically normal and there should be some site which might be productive of an embolus. In this child both demands are met, the vessels are perfectly normal and she has an endocarditis, whence the embolus undoubtedly originated. One interesting point of an embolus of the central artery, is the white cloud which forms in the temporal portion of the retina; which has been usually attributed to edema of the retina, but which Coats believed to be due to ischemic necrosis.

Discussion. DR. S. LEWIS ZIEGLER stated that he had at present under treatment two typical cases of embolism of the central retinal artery. Each showed positive evidence of focal infection, in the shape of boils, but dental radiography was negative and other sources could not be demonstrated.

The first case had received daily treatments with positive galvanism and bulbar massage for three months, when the red spot, edema, and other symptoms disappeared. Vision was 5/200 eccentric fixation, but improved to 20/70, J-14, with central vision regained. After a month's rest the galvanic current was reversed to the negative pole, and two months additional treatment administered. The fields have now widened to 40 deg., and vision has improved to 20/30 and J-4.

The second case was first seen two months ago, with peripheral light projection. With bulbar massage and plus galvanism on alternate days vision rapidly improved to 4/200, with eccentric fixation. At the end of two weeks the edema had about disappeared and the nervehead began to show atrophic changes with pallor. The current was then reversed to the negative pole in order to stimulate. Today vision is 6/200, with central vision slowly returning. The disc is still pale, but fine vascularization is reappearing. He thought the earlier the treatment was begun the better the result. The first case was seen within a few days; the second case after ten days had elapsed. Apparently daily treatments yielded better results than alternating days.

He recalled a case, seen thirty-five years ago, of double embolism in which the clot seemed to hover around in the vessel and to intermittently obscure vision before finally causing occlusion. The same type of electrical treatment was instituted with restoration of useful vision. Many other cases had responded to similar treatment. He thought, therefore, that the prognosis should never be made a hopeless one.

DR. L. WALLER DEICHLER thought that embolism of the central artery of the retina, though not a common condition, was not rare. Last September he had treated a young man, aged 30 years, who, two days before, had loss of sight in the right eye. Examination revealed no light perception, with embolus of the central artery of the retina. There was an accompanying endocarditis. This latter condition was the probable source of the embolus, an opinion substantiated by two consultants.

DR. LUTHER C. PETER said that Dr. Langdon's paper recalled three interesting cases. The first had a valvular heart lesion, but only the inferior branches of the retinal artery were involved. The patient, aged 18 years,

while being fitted for a dress, suddenly experienced sharp pain in the eye and vision became blank. The appearance of the fundus when last seen about four years ago, showed the inferior part of the nervehead with the usual atrophy, minute vessels, and marked pallor. The upper part of the nervehead appeared normal. The fields showed complete loss of the upper half down to the horizontal meridian. The preserved field had full limits. Notwithstanding this loss, the patient had continued to have full 6/5 vision.

The other cases were similar to that reported by Dr. Zentmayer, except that the macular twigs were the seat of an embolus, instead of the cilioretinal vessel. The first case occurred in a young man who had been discharged from the service in the late war, with a clean bill of health. Four months after his discharge, he suddenly experienced pain in the right eye, with complete loss of vision. He saw the patient within a few hours after its occurrence. The fundus was pale thruout, and details could only be made out with difficulty. Ultimately there developed in the area supplied by the macular artery an atrophic, well defined zone. The patient had a large central scotoma corresponding to the atrophic area. Peripheral vision was undisturbed. A Wassermann test in this case proved to be positive.

The second case occurred in a healthy young man, who, while working in front of a blast furnace, suddenly experienced pain and loss of vision. He ultimately recovered vision in the peripheral field with a central scotoma. The etiology of the embolus was undetermined.

Dr. Frederick Leavitt said that the case exhibited by Dr. Langdon had been under his care since August, 1923, with generalized choreiform movements of the entire body. All of the usual physical tests were negative. The child was kept in bed until October 1st. Shortly afterwards there developed tachycardia and a distinct rough systolic murmur. Rest in bed relieved the chorea, the heart action became regular, but the murmur persisted. Up to January 13th the child was not seen, but on that date the mother came to the hospital with her, and stated that she had been perfectly well until two days previously, when upon arising she complained of loss of vision in the right eye. The child had no symptoms other than inability to see, altho she could recognize bright light when flashed directly in the eye. Dr. Langdon was then called in consultation.

Dr. Zentmayer said that Dr. Langdon should have stated that the apparent infrequency of embolic obstruction based by Coats on pathologic examinations has no bearing on the frequency of the condition judged by clinical symptoms. He cited a case previously reported where a young man, who had lost one eye from gonococcal ophthalmia some years later, had an obstruction of a cilioretinal vessel supplying the mascular region. At the time of the occurrence of this latter symptom he had a synovitis and endocarditis. Clinically, this would seem to be a case of embolism.

C. E. G. Shannon, Clerk.

NASHVILLE ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY.

Monday, June 16, 1924.

President, Dr. E. B. Cayce.

Rupture of the Choroid.

Dr. Herschel Ezell said there are two varieties of choroidal ruptures, the direct and indirect. Direct choroidal rupture occurs at the point of contact of a blunt object striking the eyeball, and indirect ruptures occur at a point remote from the place of injury. Indirect ruptures are more frequent but in some patients we have both varieties. Von Graefe, was the first to report a case of indirect choroidal rupture. In 1854 he described two cases of choroidal rupture in his famous Archives and pointed out that the choroid could be torn separately without any external wound.

In June, 1923 Lamb estimated that 376 cases of choroidal rupture had been published. Of this number, 316 cases

were collected from the literature in 1905 by Ohm.

Direct choroidal ruptures are located as a rule in the anterior part of the choroid in relation with the point of injury. An irregular tear in the choroid is produced, thru which the sclera is seen bluish white in color. The scars resulting are intensively white, or bluish white in color.

Indirect choroidal ruptures are caused most frequently by blunt objects striking the eye. Gun shot injuries of the bones of the face and skull and projectiles which transverse the orbit without touching the eyeball also produce ruptures of the choroid. Concussions in the vicinity of the eye may also cause rupture of the choroid.

Ruptures of the choroid usually take place to the temporal side of the fundus. Hughes, in 1887, out of 72 cases collected from the literature, found 82% lying on the temporal side of the fundus, 14% on the nasal side, and 4% horizontal. In 217 cases out of the 316 cases assembled from the literature by Ohm in 1905, 65% were temporal ruptures, 23% were in the macular region, 6% were above and 6% below the disc. The same author reported 67% of the choroidal ruptures that he had assembled from the literature were single, 19% double, 7% triple, 4% quadruple, and 5% still more multiplied. Choroidal ruptures are usually sickle shaped, extending from above downward and concentric with the disc. The ruptures are variable in size, usually about one-half of the width of the papilla and four or five times as long. In the majority of cases of choroidal rupture, hemorrhage is thrown out into the vitreous and edema of the retina occurs, both of which obscure the tear of the choroid. When this does not take place, the rent appears white. If the lamina fusca is broken, a bluish sclera itself is seen and when unbroken the rupture appears white. If there is no injury of the pigmented area, there is no loss of vision but later impairment of vision is due to the interference of the nutrition of the retina by organized exudate and newly formed connective tissue.

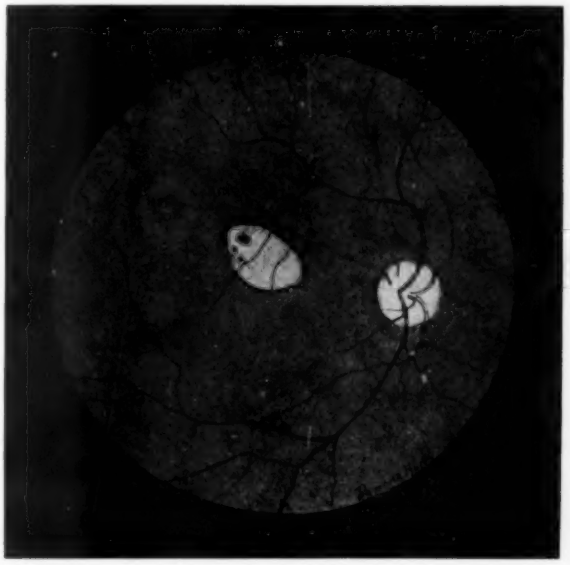

Fig. 1.—Rupture of choroid. (Ezell's case.)

The effect upon the vision depends upon the size and situation of the rupture. There is at first considerable disturbance of sight due to the injury and to effusion and sometimes to blood in the anterior chamber. The effusion and blood in the vitreous does not take place in every case and in these cases the vision is only temporarily disturbed.

However, when there is effusion, very good vision may result after absorption has taken place provided the change in the eyegrounds has not been extensive.

The case of indirect choroidal rupture that he would report had very little disturbance of vision. The patient claimed that his vision was hazy for only a few hours. There was no blood in the vitreous and no tear of or in the retina.

CASE E. E. P., age 42, was struck in the right eye by a stick of wood while cutting kindling on the morning of April 11, 1924. The examination was made within an hour after the accident. The vision was 20/20—. There was no external injury except the pupil was slightly dilated, pear shaped and extended above, downward, and inward. X-ray plates were not made. Atropin was instilled into the eye and the pupil dilated circularly and normally. Ophthalmoscopic examination of the fundus showed a large white area to the outer side and above the disc. This area was about as wide as the diameter of the disc and nearly twice as long. The area was bulging into the vitreous 2 or 3 D. and the blood vessels were clearly seen tracing over it. There were no retinal hemorrhages. The rupture has slowly receded, due to absorption of exudate, until at the present time it is almost on a level with the retina. The accompanying picture is a very accurate reproduction of the rupture. The vision has remained about or near normal during the entire time the patient has been under observation.

This patient is of interest, first because there was no extravasation of blood into the vitreous or retinal hemorrhage. Second, because of the rectangular form of the rent, and third, due to the slight disturbance of vision.

Discussion. DR. HILLARD WOOD stated that his unfamiliarity with the electric ophthalmoscope had prevented his obtaining a satisfactory view. However, basing his remarks upon the drawing of the eye, he thought the case interesting; first because Dr. Ezell saw it immediately following injury and has followed it step by step thru the various changes to the present. Looking at the picture one would get the idea that it was simply an old atrophied spot of the choroid. That idea, of course, is in error because it was seen immediately following injury and followed all the way thru. This raises the question as to how many spots of old choroiditis seen in routine practice were previously traumatic and probably ruptures. It has been his experience to see numbers of such cases, with pigmentation, that were stationary and remained so as long as they were under his observation, in some instances for years, in which cases he was never able to get anything like a definite cause for the choroidal changes nor did any treatment seem to affect it in any way. It would be interesting if one should inquire whether such an eye had been subjected to trauma at some time in the past. He inquired as to whether the pigment was present when the patient was first seen.

DR. W. G. KENNON said it was hard to conceive of a choroidal rupture without hemorrhage, yet there was no hemorrhage at the time. He could conceive of some sort of choroidal injury resulting in secondary atrophy, without hemorrhage, but does not see how there could be rupture of the choroid without hemorrhage.

DR. ROBERT SULLIVAN agreed with Dr. Kennon. Most choroidal tears or ruptures of recent, even a few days, occurrence give some evidence of hemorrhage. He stated that during his army service he saw a number of such cases, varying from a few days to several months. Most of them showed some evidence of hemorrhage and they were nearly all crescentic in shape. All recent choroidal ruptures, he believes, show some evidence of hemorrhage, and if that were close to the macula he believes there would be some blurring of vision, due to blood.

DR. EUGENE ORR said that while he was not able to see this, yet from the drawing he would not suppose that it was a recent rupture of the choroid. Dr. Wood stated that it looked like a spot of atrophy. He inquired if the pigment had been present before in the eye. He said that it struck him that possibly if the patient had been seen an hour before injury, the same condition would have been noted.

Dr. Fred Hasty said that if this was rupture of the choroid it is the third rupture of the choroid that he has seen in the past month or so, and the second case of a thing like this. The real case of rupture of the choroid he was able to make out to his own satisfaction, but not, however, upon first seeing the patient. In this case there was considerable disturbance of vision. The rupture was crescentic shaped and the patient had one thing which Dr. Hasty had never seen in a case of choroidal rupture, i. e. the iris showed little spots of blood that had not absorbed.

Dr. Ezell (closing) stated that he was firmly convinced that this is rupture of the choroid, his reasons being: First, the history of the case, which is not positive but helpful; and second, principally based upon his findings. When the patient first presented himself this area was bulging, being bulged forward some 2 or 3 D. Dr. Geo. Price, who saw the patient with Dr. Ezell, made the statement that it was bulging considerably. The vessels were looped over it just like vessels loop out of the physiologic or glaucomatous cup over this bulged area.

Dr. Wood asked whether the pigment was present at the time the patient was first seen. Dr. Ezell replied that it was not. It developed later when this picture was made. If there is any criticism of the picture it is that it shows a little bit more pigment than is really present. As to the color of the area, the text books tell us that these spots are white. They are white if the pigmentary layer of the choroid is not broken. If it is broken then they are bluish white. The white area is accounted for in that way, i. e. that the pigmentary layer of the choroid was not broken. If it had been broken he would have expected to see it bluish white instead of white.

Dr. Ezell believes there was hemorrhage away in behind this area that was bulging; some accumulation was in behind it and there is no question that it was hemorrhage.

It is atypical in that no hemorrhage in the retina could be found. Dr. Price found some exudate further around towards the corneoscleral junction. Now, however, this bulging area has receded and has flattened out until the great bulging is not present.

Traumatic Cataract.

Dr. E. B. Cayce presented the case of B. H., age 15. Patient was accidentally struck in the right eye and a triangular corneal section was made. Patient was put to bed and both eyes bandaged. After 48 hours the anterior chamber was refilled and it was evidently at that time that the injury extended thru to the anterior lens capsule and that a traumatic cataract was developing.

Atropin was instilled regularly and he was put on salicylat of soda. The eye remained irritable for 3 weeks and the condition seemed at a stand still, at which time he asked Dr. Mitchell to give him an injection of diphtheria antitoxin. He saw him two weeks later and there was a marked improvement in the eye. The lens is swollen and there is apparently some increase in tension. The lens is being absorbed and there is a question in his mind as to whether it would be advisable to evacuate the swollen lens by making a linear incision immediately back of scar or to wait until the eye is thoroly quiet.

Discussion. Dr. Hilliard Wood inquired whether there has been any increased tension and whether there has been any sympathetic symptoms in the other eye.

Dr. Cayce replied that no increased tension could be made out on palpation. The tonometer cannot be used on account of the irregularity of the cornea.

Dr. Wood suggested that the eye be allowed to get quiet, i. e. wait a few months, six months perhaps, and then needle the lens, not with a view to giving the patient binocular vision but with a view to having one fairly good eye in reserve should anything ever happen to the other eye. The patient is still a young boy and it might be that the retina would develop better, hence the vision would be better, with the cataract removed than if left as it is.

Dr. Robert J. Warner agreed with Dr. Wood in his suggestion to let the eye alone for the present.

DR. W. G. KENNON had no suggestion to offer but asked whether any present had tried milk injections. He has tried it once and it worked like a charm.

Congenital Band in the Fundus.

DR. CAYCE presented also the case of Mr. P. P. M., clerk, aged 24. Complained of a spot or line in front of right eye, which for the last few months had annoyed him very much in his work as a checking clerk in the railroad office. Has made several attempts to get glasses to relieve the condition. Slight hyperopic error in both eyes, which closely confirmed the lenses that had been prescribed. No external muscle imbalance. The right eye shows a white line immediately above and slightly to the temporal side of the nervehead, about one-half the diameter of the nervehead in length. There is no inflammatory evidence. The patient was sent to Dr. Clinton E. Bruch for a general physical examination including a Wassermann. The examination was entirely negative with the exception of a slight increase in systolic blood pressure.

Discussion. DR. ROBERT J. WARNER believes this to be some congenital change. He does not think it causes any trouble at all and has no bearing on the symptoms which the patient complains of at present. In his opinion no treatment is required.

DR. W. G. KENNON also was of the opinion that the condition is congenital. He does not see how, in view of the history of the case, anything like this could have developed and become organized without any inflammatory symptoms whatever.

DR. FRED HASTY said that first, of course, one would look at this as being inflammatory. As it is, however, it does not show any evidence of present or recent inflammatory changes; nor does it show any evidence of remote inflammatory changes. In other words, it looks like something that belongs in the eye.

HILLARD WOOD, M. D., Editor.

SPECIAL REPORT.

COMMENT ON THE BOOK "PERFECT SIGHT WITHOUT GLASSES" BY W. H. BATES, M. D.

CLARENCE LOEB, M. D.,
CHICAGO, ILL.

Patients and others ask about the advertising propaganda here referred to. Some of the statements therein circulated are here analyzed. Some obvious departures from truth are pointed out and the absurdities of such claims and catch phrases are emphasized by a series of questions.

We have recently received a letter, pamphlet and postal which have afforded us much amusement and a little indignation. Being addressed to a physician, and apparently one of similar ones sent to ophthalmologists, one has a right to demand that the statements made shall be exact, scientific and capable of proof. The author of the communication cannot complain if the recipient subjects it to a critical analysis.

Of the three, the card, alone, shows no misstatements—presumably. It is a request for the sending of a copy of "Perfect Sight Without Glasses," for which the man signing agrees to pay $5.00 to the postman on receipt of the book. The additional statement is made that the book may be returned in 5 days if not satisfactory. It does not say whether the sender or the recipient of the book is to be the judge of its satisfactory nature, nor does it mention what is to be done with the $5.00 in case the book is returned.

The letter states that the book will be sent on five days' approval without the reader's obligation to purchase. Contrast that with the above statement. The first rule of advertising should be to avoid contradictory statements, at least in the same advertisement. The letter says that we are *naturally* (our italics) skeptical about the truth of Dr. Bates'

assertions. If the literature submitted is a fair sample, we plead guilty. Three questions are asked and answered:

"(1) What is the fundamental principle? Relaxation."

Comment: Relaxation of what?

"(2) Is the lens a factor in accommodation? No."

Comment: Not even a half truth.

"(3) How is it possible to cure cataract, glaucoma and old age sight? It can be demonstrated that all are caused by strain and cured by relaxation."

Comment: All means all, so far as we are aware, and not some or a few; also, cure means cure and not check, prevent or alleviate. It would be interesting to learn how a traumatic cataract or an atropin glaucoma could be caused by a strain of something, or cured by a relaxation of anything. It would be well worth the $5.00 asked. We might even forget to ask how strain can cause the various forms of congenital cataract, diabetic cataract, fulminating glaucoma, etc., and how relaxation could cure them. But perhaps this is quibbling. Perhaps the author meant all cases of senile cataract and glaucoma simplex. Since he does not say what stage, it is to be presumed that he means any stage of cataract from incipiency to hypermaturity, and of glaucoma from the first symptoms to complete amaurosis. It would certainly be generous of W. H. Bates, M. D., to supply such information for the small sum of $5.00.

If the letter were addressed to a nonmedical man, it might be permissible to use the inexact term of "old age sight," but if we are capable of profiting by the instruction of the book, E. A. Meder, who signed the letter, might have assumed that we would understand the term presbyopia if he had used it. We suppose that is what is meant by the term, altho the closest to any real meaning of "old age sight" would be the sight (or vision) possessed by old people—which doesn't mean anything definite. Arguing with a person who uses such vague terms is like trying to step on the shadow of your own head when the sun is not directly overhead.

Take the word "strain." Does he mean "eyestrain," and if so, what does *he* understand by the term? Is it the same as we do? If he does, his statements are untrue; if he doesn't, there's no use arguing until we know exactly what he does mean.

Turning to the pamphlet, the cover informs us that "facts can't lie." This is certainly true, *but* false deductions can be made from facts, and it is always necessary to be sure that the fact *is* a fact. For instance, for centuries it was regarded as a fact that the sun moved around the world from east to west. Now we regard it as a fact that this movement of the sun is only apparent, and that it is really the earth which moves. So let us be sure that the facts quoted in the pamphlet *are* facts and not simply deductions (erroneous or otherwise) from premises which may or may not be true.

Quoting from the pamphlet verbatim: "Did you ever think the human voice would carry from one continent to another? NO! But Radio has proven it can be done, hasn't it?"

Comment: NO! Radio has proven that the human voice, by means of an appropriate instrument, can set up certain waves in the ether which, at a distance whose limit has not yet been ascertained, can register upon an appropriate apparatus and produce sounds resembling the voice that initiated the ether waves, but the *voice, itself,* has not left the room where it was produced, much less has been carried to another continent. This example, of course, proves nothing either way in regard to accommodation and vision; it is given here as a sample of the loose, inexact and unscientific statements made.

Another statement is that the book is based on thirty-eight years of research work and experiments upon the eye. It is not so stated, but the implication is that the research and experiments were made by the author of the book. The only W. H. Bates, M. D. listed in the Red Book graduated in 1885. It is evident, therefore, that even when he was a student, the fallacies of his instructors in ophthalmology weighed on him, so that immediately on leaving school he devoted himself to this work. *Parturiunt montes, erumpet ridiculus mus!* If the

Dr. Bates mentioned in the Red Book is not the author of the book under discussion, we offer our humble apologies for referring to him in this connection.

"Defective vision is not due to a change in the form of the lens but to a functional and therefore curable derangement of the extrinsic muscles."

Comment: This is another delightfully vague excerpt from the pamphlet. It leaves so much to the imagination that there is little left to reason. He might mean a decrease in the power of the action of one or more of the muscles, or an increase, or a combination of these—or something else. It has been claimed, tho not proven, that myopia is caused by compression of the eyeball due to the action of the lateral recti. Does he mean that? If so, what is the functional derangement that causes hypermetropia?

Under the head of method of treatment is given "perfect relaxation of the eye and mind." At first sight, this would seem to mean something, but does it? How does one relax an inanimate conception such as the mind? Poets may be able to do it, but can scientists? Also, how is the eye to be relaxed? Since the claim is made that refractive errors are caused by derangements of the function of the extrinsic muscles, it would seem that these are due for relaxation. But thirty-eight years of experience should have shown W. H. Bates, M. D. that when one muscle is relaxed, e. g. by paralysis, the eye promptly turns in the direction of its antagonist, which condition is hardly conducive to perfect vision. So he must mean that *all* of the extrinsic muscles must be relaxed simultaneously, equally and completely. The only condition known to ophthalmology which approximates this is the pathologic state of ophthalmoplegia externa completa, but the long stretch of ophthalmic literature, extending over more than 38 years, has failed to show a case in which vision has been improved thereby.

The pamphlet closes with another offer—or is it the same one? If one tortures the English language sufficiently, it can be made to mean almost anything. "The book will be sent C. O. D. on approval for five days. If at the end of that time, *it does not prove to be all we say of it* (our italics) it can be returned and money refunded immediately."

Thruout, the pamphlet has consistently ignored the fact that refractive errors are only a part of the causes of imperfect vision. Complete amaurosis from optic atrophy may coexist with either emmetropia, hypermetropia or myopia. Lenses or absence of lenses can have not the slightest effect upon the vision in such a case. Relaxation of the mind and eye, be it ever so perfect, will never restore the optic pathways to their proper function. And in spite of what the author claims, cataract, glaucoma, etc. cannot be cured by any form of relaxation.

Will W. H. Bates, M. D., or E. A. Meder, or the Central Fixation Publishing Co. kindly answer the following questions?

(1) What is the relation between the extrinsic muscles and the hyperopia due to retrodislocation of the lens into the vitreous? (b) How will relaxation of the eye and mind cure it?

(2) If the lens is not a factor in accommodation (see letter), what is the cause of the loss of accommodation following the use of a cycloplegic? (b) How will relaxation of the eye and mind cure this condition?

(3) Since hypermetropia and myopia are undoubtedly diametrically opposed forms of ametropia, are they caused by the same "functional derangement" of the extrinsic muscles of the eye? (b) If so, how can the same cause produce opposite effects? (c) If caused by different "functional derangements," how can they be cured by the same treatment, i. e., relaxation of the mind and eye?

(4) Are simple hypermetropia, simple hypermetropic astigmatism, compound hypermetropic astigmatism, simple myopia, simple myopic astigmatism, compound myopic astigmatism and mixed astigmatism all due to the same cause and cured by the same treatment?

(5) What determines the location of the axes in regular astigmatism? Is the cause and treatment the same whatever the location of the axes?

(6) Is irregular astigmatism caused in the same way as regular astigmatism

and can it be cured in the same way?

(7) What is the cause and what is the treatment of keratoconus? (b) Will you guarantee perfect vision by relaxation of the mind and eye?

(8) In a case of high myopia, with posterior staphyloma and retinochoroidal changes, will perfect sight be obtained by relaxation of the mind and eye?

(9) What is, or are, the cause or causes of the various phorias and tropias? (b) Will your treatment cure them all?

(10) For much longer than 38 years it has been known that convergent strabismus may be made to disappear in many cases by the wearing of the proper correcting lenses, and that it will reappear if the lenses are not worn. How do you explain this fact?

(11) Patients presenting asthenopic symptoms are frequently found to have errors of refraction. When lenses correcting these are worn, the symptoms disappear. When the lenses are left off, they reappear. How do you explain this fact?

(12) How does functional derangement of the extrinsic muscles cause the change in refraction that accompanies many cases of diabetes and albuminuria? (b) Will relaxation of the mind and eye cure it?

(13) An orbital tumor may be accompanied by a hypermetropia. Is this due to a functional derangement of the extrinsic muscles, and will relaxation of the mind and eye cure it without removal of the orbital tumor?

These are a few of the questions that seem pertinent. Doubtless our readers could think of others.

It is a well known *fact* that some people live to an old age claiming good vision and never using glasses for reading or distance vision. *But*, what is their vision in ophthalmic terms; what is their refraction; where do they hold their paper while reading; what size print can they read; how long can they read at one time; are they as comfortable as they would be if they wore correcting lenses; are they isometropic or is one eye myopic and the other hypermetropic? Such questions should be answered before such cases can be used as proof that glasses are unnecessary in individual cases. And it is a far cry to deduce from them that no one needs glasses.

It is well known, also, that some myopics see better without their glasses, using their circles of diffusion. But it cannot be argued from this that all myopics should do likewise.

The fact is, that given a nonpathologic visual apparatus, vision is the resultant of the relation of the strength of the refractive surfaces and media to the position of the retina, modified by the power of the accommodation and the fact that the eye is a living organ and not a machine. Relaxation of the mind and eye, functional derangement of the extrinsic muscles, etc., are mere "catchphrases" similar to those used by Christian Scientists and all the various vendors of nostrums and panaceas.

CORRESPONDENCE.

Equal Ametropia in Twins.

To the Editor: With regard to the curious case of twins with similar refraction published in the May issue of the AMERICAN JOURNAL OF OPHTHALMOLOGY, the following, quite recently observed, may be of interest, as such cases are not commonly met with.

It concerns two gentlemen of 30, looking almost exactly alike, as do the two sisters A.; both are painters. The refraction is as follows:

Wer. H.
O. D. V 2.+1.50⌒−0.50 Ax. 170°.
O. S. V 2.+1.25.
Ger. H.
O. D. V 2.+1.50⌒−0.50 Ax. 180°.
O. S. V 2.+1.25.

In the case of Dr. Melville Black's patients the high degree of hypermetropia amounts to a shortening of the eyeball of about 2 mm.; in the present case the ametropia is much less and the identity still more complete.

The comparison of cases like Dr. Melville Black's and the present one with others of twins with different refraction may perhaps be of interest to embryologists.

Very sincerely yours,

Paris, France MARC LAUDOLT.

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Subscriptions, applications for single copies, communications with reference to advertising or other business, should be addressed to the Manager of Subscriptions and Advertising.

JEAN MATTESON, Room 1209, 7 West Madison Street, Chicago, Ill.

OPTICAL HELPS FOR PARTIAL CATARACT.

The frequent and extreme changes of refraction that often occur with developing cataract have frequently been described and are becoming better understood. Two other conditions associated with lens opacity, and causing annoyance or disability, for which patients seek relief are: shutting off the light entering the eye to form visual images, and diffusion of light that makes it more difficult to perceive such images as may still be formed.

In complete cataract, the shutting off affects all light entering the pupil, so that no definite image is formed on the retina; the sense of light perceived being the same for light entering the pupil, as for that entering thru the closed lids, or the sclera. In partial cataract parts of the crystalline lens remain relatively clear; and if light can enter the pupil so as to pass thru these parts of the lens, a definite image may be formed.

Entrance of light thru such relatively clear parts of the lens may be secured by iridectomy, which is recommended for some cases of lamellar or of nuclear cataract. But if the opacity is central, particularly anterior polar, or limited nuclear cataract, the dilatation of the pupil, maintained by weak solutions of atropin applied at rather long intervals, may be of great benefit. Very useful vision is thus maintained for years in some cases.

The diffusion of light falling on the opacity, which partly "drowns out" the impression of any definite image on the retina, is one of the most serious annoyances attending partial cataract. The patient seeks to avoid it by shading his eyes with his hand, or his hat brim. Much relief is often afforded by the wearing of dark glasses, so that these are appreciated as much as lenses that correct the refraction. Dilating the pupil to bring a clear part of the lens into service always tends to increase the annoyance from light diffused by the opacity.

Recently, Charles M. Scherer, Opt. D., of Chicago, has suggested and described the use of opaque spectacles for partial cataract, that will secure dilatation of the pupil, to the extent usually beneficial in such cases, by excluding light from the eye, except that which enters thru a small aperture from the direction of the object looked at. In some cases such spectacles will probably give the same benefit as dilatation of the pupil by atropin; and at

the same time will lessen, instead of increase, the annoyance from light diffusion within the eye.

This method of placing a diaphragm before the eye, as Scherer points out, does not involve the principle of the pinhole disk. It does not improve vision by decreasing diffusion circles due to ametropia. Its effect depends on excluding the light which enters normally thru the lids and sclera, quite as much as the cutting down of what would enter thru the pupil. It provides really a form of stenopaic spectacles, such as are sometimes used for opacities of the cornea; or are like the wooden goggles used by some of the Esquimaux to prevent snow blindness.

These spectacles resemble the old fashioned goggles used to protect the eyes from foreign bodies. They have opaque side shields; and glass is replaced by an opaque disk in front, in which an opening is made to admit such light as will be most useful and least annoying. To be of the greatest benefit, the size, form and position of the aperture in the opaque diaphragm must be chosen to meet the conditions of the particular eye. The correcting lens should be used for this aperture. In general, a different aperture will be needed for reading from that which will be most serviceable for general use and distant vision. The most careful examination and testing of each eye to be thus benefitted, and the accurate fitting to the face of the spectacles decided on, are of the utmost importance in using this means of assisting those who come to us with partial cataract. E. J.

THE BRITISH OPHTHALMOLOGICAL SOCIETY.

The above is what the organization has often been called; but it is not the official name of the society that will act as host to the English speaking ophthalmologic societies at the London Convention, July, 1925. The official name has always seemed long and cumbersome—The Ophthalmological Society of the United Kingdom of Great Britain and Ireland. From the first, it has almost invariably been abbreviated; but in the full length it has a special significance. It was chosen to express, before everything else, a welcome to all ophthalmologists living in the British Islands and thruout the Empire.

The Society was proposed and promoted by eminent London ophthalmic surgeons. But their first thought was, to give to their colleagues in other parts of England and in Ireland and Scotland the same rights and the same proprietorship in it as themselves. The spirit, that was worth expressing in an awkward name, has dominated the Society from its beginning and will find its highest, widest expression in the plans for the Convention next July.

This Society was the great gift to their successors from the men who had shaped ophthalmology in the formative period of this new branch of the medical profession. At the first meeting for organization, held the evening of June 23, 1880, William Bowman, not yet "Sir William", presided. Among about thirty who took part in the meeting was Mr. George Critchett, who proposed "That an ophthalmological society of the United Kingdom be formed." Dr. Hughlings Jackson seconded this proposition and it was carried unanimously. Robert Brudenell Carter, Henry Power, John Couper and Dr. Allen Sturge took an active part in organization. Mr. Bowman was chosen President; Mr. Critchett, Jonathan Hutchinson and Hughlings Jackson, of London, Mr. T. Pridgin Teale of Leeds, Mr. William Walker, of Edinburgh and Mr. H. R. Swanzy, of Dublin, Vice-Presidents. The secretaries were Dr. Stephen Mackenzie and Mr. Edward Nettleship. Other members of the committee to which the affairs of the new society were intrusted were: J. F. Streatfield, Treasurer, Mr. J. E. Adams, Dr. Thomas Barlow, Dr. W. A. Brailey, Mr. Brudenell Carter, Dr. William Gowers, Mr. Charles Higgens, Mr. J. W. Hulke, Mr. Henry Power and Mr. Warren Tay. Others actively participating in the meeting were Mr.

Frederic Mason, Mr. Spencer Watson, of London and Mr. Vose Solomon, of Birmingham. The objects of the Society as proposed by Mr. Bowman were: To publish transactions and to meet about five times a year.

The first scientific meeting was held at the rooms of the Medical Society, October 28, 1880. At this first meeting the custom began, of giving clinical cases the precedence over the papers of the evening. Dr. Gowers exhibited two cases of optic neuritis and Mr. Nettleship showed a nodular growth of the iris. Then, Mr. Hutchinson read a paper on a case of primary intraocular hemorrhage. During the year, thus begun, meetings were held in January, March, April and July, the April meeting being held to complete a discussion opened in the March meeting. At the opening of the second year the President announced the first volume of the Transactions was that day published. Before the end of 1882, George Critchett, one of the most eminent of the original members, who as Vice President had presided at the meeting of July 7th, died at the age of sixty-five.

When Mr. Bowman retired from the Presidency of the Society, in 1883, he made a very important contribution to its funds; and about the same time. on the recommendation of the Council, the Society established the Bowman Lecture; which has from time to time been delivered by twenty-three of the most eminent ophthalmologists of the time, thirteen who were members of the Society and ten from other countries. These lectures have been extremely valuable contributions to the literature of ophthalmology.

In 1901, when Edward Nettleship retired from practice, his friends and pupils gathered a fund to provide for awarding from time to time, to British subjects, a prize commemorating his name. Up to this time, the gold medal thus provided has been awarded to seven members of the Society for their most valuable contributions to ophthalmology. The Library of the Society, begun in 1884 with the active support of Mr. Bowman, has grown steadily until it now is said to be the best of its kind in the world.

In 1912, the Royal Society of Medicine in London decided to establish a Section of Ophthalmology, to hold monthly meetings thruout a part of the year. On negotiations with this body, the Society of the United Kingdom decided to hold all its sessions for the year in one week, as do other national bodies; and since that time its annual congress has been held near the first of May. Its library has been installed in a separate room in the building of the Royal Society of Medicine, where it is at all times accessible to the members.

In 1917, the Council of the Society worked out a scheme for the affiliation of other ophthalmologic societies thruout the Empire. The next year, two of these had unanimously accepted the offer and subsequently others agreed to its provisions, so that these affiliated societies now include: The Oxford Ophthalmological Congress, Midland Ophthalmological Society, North of England Ophthalmological Society, Irish Ophthalmological Society, Scottish Ophthalmic Club, and Ophthalmological Society of Egypt. Such affiliation includes the publication of papers read before the affiliated societies in the annual volume of the Transactions.

It has added to the strength and prestige of the Ophthalmological Society of the United Kingdom; and especially entitles it to take the lead in bringing about anything like a Convention of the English speaking Ophthalmological Societies of the world. No one can doubt the hearty good will expressed by the invitation and the solid efficiency thereby guaranteed for its management. The practical tendency of the work done in the forty-four years this society has been holding its meetings and publishing its transactions, will make the London meeting extremely attractive to ophthalmologists in all parts of the world.

E. J.

NEW DEPARTMENTS.

In the next few months two new departments will be developed in this journal. The first of these will appear in October, headed New Instruments. It will not be taken up with original descriptions of new operating instruments, or first suggestions of modifications of apparatus. It will explain and describe instruments introducing new principles and methods that have already been put before the profession, and seem to be of enough importance to be understood by all practical ophthalmologists.

Some may be new only in the sense that they have not been generally understood and used. Some of them are likely to come into general or universal use. Others furnish the means of important observations that may be made by only a few skilled observers, but which should be understood and appreciated by all. This department will be under the editorial care of Dr. Harry S. Gradle.

E. J.

BOOK NOTICES.

Atlas of the Histopathology of the Eye. By **Adalbert Fuchs, M. D.**, Privatdozent of Ophthalmology at the University of Vienna. 191 illustrations contained in 44 colored plates. Published by Franz Deuticke, Leipzig and Vienna.

The original, German, edition of this book has already been reviewed (A. J. O., 1924, v. 7, p. 402). The present one is an English translation by the author, and consists of forty-four colored plates, comprising one hundred and ninety-one illustrations, with eleven pages of index to the illustrations, the whole bound in cloth.

In addition, there is a pocket into which is slipped the text describing the illustrations. This consists of eighty-seven pages, with the index, which are bound together; but unfortunately it has no separate binding, so that the printing commences on the front cover, and ends on the inside of the back cover. Much handling, unless it is bound after purchase, will likely result in tearing or loss of pages. The paper is of good quality and the printing is clear and easily read. There are a few typographic errors, principally in the punctuation, but the English is idiomatic and of a high grade.

It is to be hoped that this book receives the enthusiastic reception that its quality and opportuneness deserve. Its value can be no better expressed than by quoting the words of the author: "This atlas is especially adapted to the needs of the practical ophthalmologist, who will reach and retain a clearer understanding of the eye and its diseases through a knowledge of the anatomic basis of clinical signs and symptoms. Furthermore, this atlas is adapted to the use of the surgeon. He will find numerous pictures of eyes that were operated on with good and with bad results. Lastly, it can be used to great advantage by those who, without any special preparatory training wish to work in pathology of the eyes."

C. L.

Die Lehre von den Pupillenbewegungen. Dr. Carl Behr, Professor of Ophthalmology, University of Hamburg. Paper, 236 pages, 34 illustrations. Berlin, Julius Springer, 1924.

The literature on the pupil movements is enormous. The bibliography here published, covering 1840 to 1920 inclusive, occupies 63 pages, over 1600 titles, yet this is the first systematic book upon the subject. It represents more than fifteen years of thought and labor on the part of its author. He hopes it will be found of interest to ophthalmologists and also to internists, neurologists and psychiatrists.

The treatise begins with an account of the anatomic basis of the pupil movements. Then follow the physiology and the pathology of those movements. After these, is given an outline of five different schemes of the nerve tracts concerned in the pupil movements, and last, a section on the observation and study of these movements.

The schemes of nerve tracts con-

trolling pupil movements are those of Bach, Levinsohn, Liepman and Bumpke, Groethuysen and Behr. Each of these is illustrated by one or more diagrams. It is notable that the later schemes, worked out within the last ten years, are very much simpler than the earlier ones, enunciated about twenty-five years ago. This is the best evidence of real progress in the knowledge of pupil movements.

E. J.

Jahersbericht über die gesamte Ophthalmologie. Edited by Professor Dr. O. Kuffler, Berlin. Review for the year 1921. Paper, 540 pages. Berlin, Julius Springer, 1924.

As pointed out last year, this year book forms a single organic whole with the Zentralblatt für die gesamte Ophthalmologie und ihre Grenzgebiete, also edited by Dr. Kuffler and published by Springer. This volume fits the "Centralblatt" as a key fits a lock; and the one loses much of its usefulness without the other.

This second issue of the resuscitated "Jahrsbericht" is decidedly better than the first. If that was a disappointment, this comes as a pleasant surprise. Its digest of the literature, 274 pages, instead of being 25 pages less than the bibliographic lists of references, is now 36 pages more. The number of collaborators who have joined in the preparation of this volume is twenty-six, a few more than assisted with the last.

The period of more than two years that has elapsed since the end of the year 1922, the literature of which is here reviewed, has given time for the bringing together and careful digesting of the literature; and in this process the American literature was not neglected. We note particularly, papers appearing in the JOURNAL have generally received adequate notice. Some papers published in general medical journals have not fared so well.

The exact total number of papers here referred to is difficult to compute, because there are some duplications. The duplication of names in the index of authors is more striking. Under "Gradle", we find H. S., Harry and Harry S., all referring to the same author; under Jackson are E and Edward. Even Professor Fuchs figures as E. and Ernst. Obviously this arises from the practice of the author in having his name differently given in connection with different papers. When it comes to mentioning these in a year book, to avoid mistakes in crediting authorship, by grouping together all that has appeared from one writer would entail enormous labor on the part of the editor; or the greater error would be crediting to one what had been produced by another. Not rarely, two writers may have the same initials.

The best way to avoid uncertainty is always to give the full name, or at least exactly the same combination of name and initials. The practice of giving only the last name, with perhaps the title Doctor or Professor, or both, is always bad; and certain, sometimes, to cause confusion, as we have had occasion to point out before. An exception to the practice of always giving the full name is only justified when the name is repeated, as in the proceedings of a society; or where in editorial work initials, or a part of the name, may be used, the full name being given elsewhere in the issue, in a list of editors or collaborators.

E. J.

Tonsillectomy. By means of the alveolar eminence of the mandible and a guillotine, with a review of the collateral issues. By **Greenfield Sluder,** M. D., Clinical Professor and Director of the Department of Rhinology, Laryngology and Otology, Washington University, School of Medicine, St. Louis, Mo. Cloth, 90 illustrations, 176 pp. C. V. Mosby Co., St. Louis 1923 (See also p. 559).

The first two chapters deal with the embryology and anatomy of the tonsils with historical data concerning the earliest methods for tonsillectomy.

Chapter III, (40 pages) on the Physiology and General Pathology of the Tonsil is written by Arthur W.

Proetz, M. D., Instructor in Laryngology, Washington University, School of Medicine, St. Louis, Mo. This chapter is very readable, instructive and comprehensive.

The remainder of the text proper deals with indications for tonsillectomy and prognosis, preoperative treatment, and tonsillectomy technic.

The last chapter, which is an addendum, discusses Adenoidectomy with Direct Vision and is written by I. D. Kelly, Jr., M. D., Instructor in Laryngology, Washington, University, School of Medicine, St. Louis, Mo.

This text is well written. The references are timely and unusually numerous. There is a note of conservatism thruout which speaks highly for the sincerity of the opinions voiced. One cannot but admire the admonition given on p. 98: "Technic—the Surgeon Should Not Abandon a Satisfactory Technic."

This publication will be useful as a reference to the many sides of the tonsil question. It centers interest on the Sluder Tonsillectomy Technic, which is a technic to be best learned by practical personal instruction and not from books or illustrations.

Unavoidably, almost any laryngologist will differ with Dr. Sluder in some of his dicta regarding tonsillectomy. This would, however, be true no matter who the author or what the method used.

John Howard Harter.

Eyeless Sight. Jules Romains, formerly student of the École Normale Supérieure of Paris. Translated by C. K. Ogden. Cloth, 262 pages, with portrait of the author. New York, G. P. Putnam's Sons.

From the experience of the past, it is safe to predict that in the near future many readers of this JOURNAL will be asked about this book and its subject. Questions about "seeing without eyes" will replace those about focussing without lenses and "seeing black."

The author of this book is classed with a group of current French writers as a poet and "founder of the style of Unanisme, or absolute expression of reality in verse" of course "verse libre". This bright writer, searching for a subject, novel and of wide enough interest to command a reading public, hit upon this one. Of the possible phantasies that imagination may conjure up, why not amuse ourselves with this?

As the writer of fiction creates an atmosphere and background of reality, by the circumstantial description of actual scenery or historic events, so this excursion into the realm of speculation is introduced by quotations as to the histology of the skin, its nerve endings, the functions of which are not well understood and not easily demonstrated by physiologic experiment. Why may not some of these nerve endings be responsive to light?

Of course, we are not conscious of any such response; but the conception of subconscious mental operations is appealed to, as possibly responsive to this light influence. Speculative physiology and metaphysics are ininvaded to escape the hard facts of physics and physiology; as the Germans marched across the inviting fields of Belgium to escape the fortresses that defended northeastern France.

When it comes to what purports to be experimental demonstrations of this power of eyeless sight, we get down into a morass of apparent deception and pretense, very similar to that into which believers in spiritism so often flounder, and into which investigators of clairvoyance wander so often, never to return. The author has devised some apparatus, which he seems to think is proof against deception; and has applied it to four subjects, about whom he seems to know little and says less. He, however, naively states that when it was suggested that they repeat their "experiments", under conditions proposed and supervised by certain physicists, they disappeared and he knows no more of them.

To quote the author's words: "What we have attempted to achieve is a collaboration of experimental psycho-

physiology necessarily macroscopic, and histological analysis". What he seems to have achieved appears to be a large amount of speculation and verbal analysis, on a very insufficient basis of alleged experiment. The book is well written, ingenious, plausible and interesting.

ABSTRACT DEPARTMENT

Reprints and journal articles to be abstracted should be sent to Dr. Lawrence T. Post, 520 Metropolitan Building, St. Louis, Mo. Only important papers will be used in this department, others of interest will be noticed in the Ophthalmic Year Book.

Gallemaerts. Diagnosis of Intraocular Foreign Bodies with Help of Gullstrand Lamp. Ann. d'Ocul. 1923, v. 160, pp. 164-165.

In a case seen one month after the accident, the magnetometer showed the presence of a metallic body in the eye. The ophthalmoscope showed blood in the vitreous, behind some fibrils. With the aid of the Gullstrand lamp, these fibrils were seen to move when a magnet was brought close to the eye, which movement varied with the position of the magnet. This fact allowed a judgment of the best place for the incision. The method can be used only when the media are transparent.

C. L.

Mann, Ida C. Function of the Pecten. Brit. J. Ophth., v. 8, No. 5, 1924, p. 209.

The investigator has made an inquiry into the function and morphology of the pecten as found in the domestic hen. The structure presents eighteen folds, measuring on an average 8 mm. at its base and 5 mm. at its broadest part. The free edge is united by a tissue known as a bridge. The base is attached along the linear optic disc including the cauda or tailed out lower portion of the nerve. The pecten is densely pigmented and extremely vascular.

In considering the function of the pecten the chief possibilities for consideration are as follows: It may be connected with the mechanism of accommodation. It may be nutritive in function. It may regulate the intraocular tension. It may modify in some way the operation of the eye as an optical instrument and effect the formation of images on the retina. It may be a sense organ.

The author attempts to settle some of these points by an inquiry into: 1. The minute structure of the pecten tissue. 2. Its situation and optical properties. 3. The intraocular nutrition of pectinate and nonpectinate eyes.

In a discussion of the observations of others and a description of the author's own investigation, as depicted by sixteen illustrations, the following conclusions were arrived at: 1. The main function of the pecten is the nutrition of the retina by means of fluid interchange thru the vitreous network. 2. Morphologically the pecten corresponds with the retinal vessels of mammals. 3. The pecten exercises a beneficial effect on the eye by neutralizing passively any sudden changes in the intraocular tension. 4. Its peculiar form and arrangement are but one of the expressions of the high degree of specialization of the avian eye in the direction of increased efficiency as an optical instrument. Eleven references accompany the contribution.

D. F. H.

Percival, A. S. Prescribing Spectacles. Brit. J. Ophth., v. 8, No. 5, 1924, p. 229.

The author in this contribution counsels care and judgment in ordering certain types of lenses for presbyopia, particularly, in the higher strengths and in anisometropia. The lenses may be accurate, normally centered opposite the pupils in the primary position, but when reading the eyes are depressed as much as 14° or 15°, thus the line of fixation traverses the lens several mm. below the geographic center of the lens. In aniso-

metropia, this produces an uncomfortable hyperphoria. Decentration down is indicated. Thoughtful attention should be devoted to the subject of periscopic effect in ordering certain degrees of lenses. To illustrate +S 3⌒—6 cy×180 should be ground —3 S placed next to the eye with the + 6 cy×90 out, thus giving the periscopic effect in the horizontal direction. Periscopic lenses are fairly easy to order if there is no astigmatism, but when present toric surfaces must be ordered. As toric lenses are ground on a 3 D, 6 D or 9 D base much ingenuity will be required in getting the best possible results. The author gives a series of equations, illustrating how the best periscopic effect can be obtained in ordering compound and mixed astigmatic lenses.

D. F. H.

Backhaus, M. Encephalography for Differential Diagnosis of Hydrocephalus from Tumor Metastasis. Klin. M. f. Augenh, 1923, v. 70, p. 330; 539.

Eighteen months ago the left eye of a boy, aged five and one half, was enucleated on account of a rapidly growing tumor, which was diagnosed as severe tuberculosis of the optic nerve by one clinician and by another as sarcoma. In February, 1923, vision of the right eye failed rapidly, ending in total amaurosis from atrophy of the optic nerve. The question was whether this was due to a metastasis or another process, probably internal hydrocephalus. Tuberculin reaction and roentgen rays gave negative results.

The encephalography of Bingel by intralumbar insufflation of air, resulted in the diagnosis of internal hydrocephalus. It was observed that prolonged lying on one side elicited a different falling of both ventricles observed in roentgen pictures. Further, that the complete evacuation of the fluid gives no better results than partial with regard to the roentgen skiagraphs, and that it may lead to disagreeable complications. As the method of intralumbar insufflation of air is technically not difficult and without danger, it may also be of service to the ophthalmologist for the diagnosis of retrobulbar processes. The patient died from intercurrent measles and the autopsy showed extensive bilateral hydrocephalus and at the stump of the left optic nerve a tumor of not uniform structure, a gliosarcoma the size of a walnut. C. Z.

Samojloff, A. J. Enlargement of the Blind Spot after Subconjunctival Injections of Salt Solution. Klin. M. f. Augenh. 1923, v. 70, p. 655.

According to Wessely, the effect of subconjunctival injections consists in an irritation of the ciliary nerves, which leads to increased activity of the ciliary processes, causing an increase of tension. Samojloff observed increased tension one half hour after subconjunctival injections of 5% salt solution, lasting for two hours. Simultaneous with this was enlargement of the blind spot, maximal after thirty minutes. The increase of the scotoma never persisted longer than one hour after injection. The measurement of tension and scotoma after repeated injections always gave the same results.

A fundamental difference exists between the atrophic scotomas, such as, paracentral scotomas after toxic affections of the papillomacular fibers, and the early glaucomatous scotomas. The latter, as also the scotomas after subconjunctival injections, are explained by the natural reaction of the eye to the pressure. C. Z.

Berens, C. Jr. Examination of the Blind Spot of Mariotte. (bibl.) Trans. Amer. Ophth. Soc., 1923, v. 21, pp. 271-290.

The indications for a clinical routine to distinguish the abnormalities of the blind spot are enumerated as follows:

1. Whenever the vision cannot be improved to normal by correcting lenses, no cause for this phenomenon being evident.

2. When there is a history of headache or nasal trouble, chronically inflamed eyelids or conjunctiva, or congested eyes that do not improve rapidly under treatment. These symptoms and physical signs lead one to suspect sinus involvement, particularly

if accompanied by retrobulbar tenderness.

3. When dacryocystitis or stenosis of the nasolacrimal duct is present, frequently accompanied by sinus disease as an etiologic factor.

4. When glaucoma or disease or anomalies of the deeper structures of the eye are present or suspected, particularly when the optic nerve is involved.

The confrontation test, at one meter's distance, measured and accurately maintained by a string, is given as a rapid accurate clinical test. Haitz stereoscopic method is of clinical value but will not detect slight changes. The main disadvantages of the Peter hand campimeter are its short radius and lack of adjustment of the distance of the eye from the point of fixation. For accurate work the Bjerrum screen, or one of its modifications, is the most useful method.

Attention is drawn to the fact that there are many variable factors in estimating the size of the blind spot, and it is urged that each investigator should establish his own standard of normal for his own method of investigation. A table of blind spot measurements for notation by various authors shows conclusively that certain factors do cause variations in the size of the blind spot. As for differences in its size in male and female patients and between the right and left eyes, the writer, by compiling the averages of the blind spots of seventy-nine male and female patients, concludes that they are so slight as to be ignored in clinical examination.

That there is a relative scotoma for white and colors surrounding the absolute blind spot scotoma, as stated by several different authors, especially with a black or dark gray screen and constant artificial illumination, was confirmed by the writer. The rapid fatigue for colors and white in early optic nerve involvement, in the area immediately surrounding the blind spot, is a valuable early physical sign, especially if one finds a great difference between the limits of the blind spot with the motion of the test object in and out of the blind area.

Concerning the variable factors in the examination which may change the size of the blind spot, the distance of the eye from the point of fixation is considered the most important, hence all apparatus should have some means of easily varying the distance from the point of fixation. Fixation is held next in importance and binocular fixation gives more uniform results than monocular. A simple way to obtain it, is by the use of a card held between the eyes with a place cut out for the nose, or a small cylindric tube may be held over one eye or made so that it may be set into a trial frame. The anatomic variations in the size of the nerve are mentioned next, also the influence of fatigue, altho the practice error is undoubtedly more important. Illumination is considered an important practical factor only when markedly reduced and daylight illumination is always preferable when testing for colors. The visual reaction time in determining physiologic variations in the blind spot is another consideration and it is for this reason that measuring the blind spot from the seeing to the blind area and vice versa is suggested.

The wearing of correcting lenses is advantageous:—when the visual acuity is thereby improved; to overcome fatigue; in fixing a near test object; in high hyperopic and in presbyopic patients; or when using an instrument in which the distance of the point of fixation is close to or within the near point of accommodation. D. H. O'R.

Scarlett, H. W. Traumatic Neurology of the Eye in Relation to Cerebral and Other Injuries. (bibl.) Trans. Amer. Opht. Soc., 1923, v. 21, pp. 247-270.

Scarlett reviews the literature pertaining to traumatic neurology of the eye and discusses it.

1. The nervous system may sustain severe organic and psychic damage, but is capable of tremendous recovery.

2. The macula has a circumscribed cortical center in the posterior portion

of the visual area, but the question has never been definitely settled as to whether it has a unilateral or bilateral innervation, altho the weight of evidence seems to favor the latter. The preservation of normal acuity of vision is compatible with the destruction of one macular center, either the right or the left.

3. Hemianopic fields are roughly symmetric but are not always exactly superimposible. Superior defects are less frequent than inferior.

4. Visual fields are gradually restored from the center toward the periphery. White objects are recognized before colored ones.

5. The character and form of scotomas may give valuable aid as to the location of the lesion causing them.

6. Concussion producing ocular manifestations was seen more often than other cerebral injuries. Pupillary changes were the most constant symptoms of this condition.

7. Mydriasis is the most important symptom of general head injuries, especially of the frontal wounds. It is usually on the side opposite the lesion.

8. Argyll-Robertson pupils are not necessarily the result of lues. They may be caused by concussion or general head injuries affecting the cerebral peduncles. They improve as the general condition improves.

9. Lumbar puncture, frequently repeated, is a valuable procedure in relieving the symptoms of cerebral concussion, general head injuries and wounds of the spinal cord.

10. In sympathetic nerve injuries, lower lesions affecting the brachial plexus roots, thru which sympathetic fibers run, are the most severe. Lesions higher up, involving the sympathetic nerves, produce less severe symptoms, as a rule, than root lesions. Contusions of the cord result in the least pronounced phenomena, and are more prone to complete recovery.

11. Pupils of patients with root and nerve lesions do not usually dilate under cocain. Those with cord contusions do dilate. D. H. O'R.

Brouwer, P. Experimental Anatomic Investigations of the Retinal Projection on the Primary Optical Centers. Arch. Suisses de Neur. et de Psych. v. 13, Festschrift f. von Monakow.

Incisions in the retina were made with a small needle, chiefly in rabbits, a few in cats. Shortly before death a picture of the retinal lesion was made; 18 days after the traumatism the animal was killed. The brain was prepared for the Marchi method and serial sections made thru the optic nerves, chiasm, optic tract and the primary optic centers. The left eye was always used for experimentation. The following conclusions were reached after the study of 12 serial sections of rabbits and 4 of cats: The localization principle is constantly present. It begins in the optic nerve, but here no absolute localization for the different retinal parts is found. It can only be said that the fibers from the upper part of the retina have a tendency to course more dorsally than those from the ventral half. Those from the upper part of the retina are in the lateral portion of the nerve while those from the ventral half of the retina are more in the middle of the cross section. One can go no further than to state that the nasal retinal parts send their fibers medially to those belonging to the temporal retinal quadrants. It is very difficult to make a definite localization. In the tractus opticus the fibers from the upper retinal quadrants pass chiefly thru the ventro-medial part and from the lower quadrants thru the dorso-lateral part. This transposition of fibers occurs chiefly in the chiasm, so that the conclusion is warranted that in a rabbit's chiasm, not only a partial crossing from right to left takes place, but also from dorsal to ventral and vice versa. The localization in the optic tract is not an absolute one as a partial mixture of the fibers is present. Henschen is right in that distinct retinal parts are projected on distinct parts of the corpus geniculatum externum. The upper retinal half lies always ventral to the lower. A reversal therefore has taken

place. The fibers from the temporal half tend to end medially in the corpus geniculatum externum, the nasal ones more laterally. These fibers, however, do not cross. The four division lines are not exactly horizontal and vertical in the corpus geniculatum externum, as the nasal quadrants project below the temporal ones in different places. In cats, the reversal is more complete than in the rabbit. The difference probably depends on the different position of the eyes in the head. The reversed retinal picture becomes upright in the corpus geniculatum externum. The upper and lower, the nasal and temporal quadrants do not overlap in the corpus geniculatum externum. The borders between these projection areas are rather sharp. Apparently, the fibers from the temporal lower quadrant of the retina become mixed in the corpus geniculatum externum with the direct fibers.

The localization principle is also very distinct in the corpus quadrigeminum anticum of the rabbit. A certain amount of reversal takes place. Some quadrants have a common broad contact surface, while this is absent for others. Such a relationship was also found in corpus geniculatum externum. It seems sufficiently explained by the law of neurobiotaxis (Ariens Kappers), as the quadrants which are often together optically stimulated (e. g. lower temporal in one eye and lower nasal in the other) touch here in the primary optical centers over a large extent, while others (e. g. lower temporal and upper nasal), which are far less often stimulated together, hardly touch.

Extirpation of one eye shows in the contralateral small ventral ganglion geniculatum externum, a fine punctation between the grosser bundles thus demonstrating the division and end of optical fibers. This is much less distinct with partial lesions in the retina. One receives the impression, that most of these fibers only pass the small ventral ganglion. Experiments have proven that this part is not connected with the cerebral cortex. It is probably connected with the corpus quadrigeminum anticum.

It is generally accepted that the pulvinar receives a part of the primary optic fibers. However, it is dubious if the part of the thalamus in rabbits, in which primary optic fibers are found, can be compared directly with the pulvinar of the higher mammalia. The majority of the fibers which were found degenerated, only bend around this part of the brain in their course toward the corpus quadrigeminum anticum. This must be accepted unconditionally for a part of the fibers which are found in the layers contiguous to the thalamus. The number of the fibers taking this course in the cat is distinctly smaller than in the rabbit. Minkowski in some cases in apes and men did not find after removal of one eye secondary reactions in the pulvinar. As we ascend the mammalian side this "pulvinar radiation" becomes also gradually smaller, altho the reverse is expected, because the pulvinar itself increases. It is, therefore, probable that the end of the primary optic fibers in the pulvinar is only apparent and they only pass thru this region on their way to the corpus quadrigeminum anticum. This would better explain some clinical facts. Foci in corpus geniculatum externum without affection of the pulvinar, produce complete hemianopsia, and foci in the pulvinar without lesion of the corpus geniculatum externum do not produce grosser disturbances in the visual field.

Brouwer has been impressed with the position of the different quadrants in rabbits and cats and he now surmises that the relations in the primates are also different from the most widely accepted theory. V. Monakow is ungrudgingly in the right, when he states that in analysing the organization of the central optical systems, the corpus geniculatum externum primarily should be in the foreground of our attention. The paper is illustrated with 24 figures. E. E. B.

LaRusso. Influence of Ametropia on the Peripheral Limits of the Visual

Field. Ann. di Ott. e Clin. Ocul., 1923, v. 51, p. 751.

The author reviews previous opinions on this subject, it having usually been considered that a hyperopic eye will have a larger field than a myopic eye. The author believes that this should be true theoretically since, according to his figures, a given area in a hyperopic eye will correspond to a larger area on the perimeter than an equal area of the fundus in a myopic eye. In axial myopia of 10° a tract of 10 mm. of retina would have a perimetric projection 5° less than the corresponding tract in an ametropic eye. For an eye of 10° axial hyperopia on the other hand, the perimetric projection would be 5° greater than that of an ametropic eye. The author tested this out on patients with high refractive errors, comparing the field for green with and without correction. The results correspond to what would theoretically be expected with a fair degree of accuracy. One degree of myopia was found to cause a diminution of the visual field of about ½° and 1° of hyperopia a corresponding increase.

S. R. G.

Maggiore. Development of Scleral Canal and the Lamina Cribrosa in the Human Eye. Ann. di Ott. e Clin. Ocul. 1923, 51, p. 727.

The author has studied this by means of sections of embryos fairly representative of all stages of development. In the adult eye the lamina cribrosa shows an anterior part of choroidal origin composed principally of glia, and a posterior part of scleral origin composed chiefly of connective tissue. They are not absolutely distinct, as a mixture of the two kinds of tissue may be seen, but in the main, differential stains such as Van Gieson's show that an anatomic division can be made. The scleral ring of Fuchs' is composed of the most internal fibers immediately surrounding the nerve. The normal lamina cribrosa varies principally in three respects; 1st, position; 2nd, size of of bundles; 3rd, number of bundles. The history of the nerve before the third month is divided into 1, an epithelial stage; 2, a stage of the development of the limiting membrane; 3, a stage of the development of the optic fibers. At first the glial tissue is irregular and is distributed with no definite relation to the fibers. By the beginning of the third month, however, it is arranged in distinctly transverse and longitudinal fibers. By the end of the third month the first differentiation of the pial sheath can be made out. In the middle of the sixth month the first sign of scleral fibers passing into the optic nerve is seen as a fine process, passing between the nerve fibers anterior to the origin of the pial sheath. At this time there are also processes extending from the pial sheath between the nerve fibers. These two elements together make up the lamina cribrosa which may be said to be actually present at the middle of the seventh month, at which time the permanent relations between the nerve, sclera and optic sheaths are established. The lamina cribrosa, however, does not attain anything like its permanent form until the end of the eighth month and even at term the fibers are very lax and the spaces relatively large.

S. R. G.

NEWS ITEMS

DEATHS.

Dr. Samuel H. Hager of Chicago, aged fifty-nine, died June seventh from cerebral edema.

Dr. Joseph M. Raub, Brooklyn, aged seventy-six, died July second, following an appendectomy.

Dr. Thomas Franklin Keller, Toledo, Ohio, aged sixty-four, died June twenty-fifth.

Dr. Frederick E. Cheney of Concord and Boston, aged sixty-two, died July second of a carbuncle of the lip.

Dr. Louis Rutten, died at Liege, December 17, 1923. This announcement comes to us thru the 1924 issue of the Bulletin de la Société Belge d'Ophtalmologie.

PERSONAL.

Dr. Louis Deane is spending the summer in Europe.

Sir John Herbert Parsons of London, England, was a San Francisco visitor during the early part of July.

Dr. Adolph Barkan is spending the summer in Switzerland in company with Professor Fuchs of Vienna.

Dr. and Mrs. Dean S. Smith of LaCrosse, Wisconsin, have returned from four months' study in Vienna.

Dr. H. Moulton of Ft. Smith was elected President of the Arkansas Medical Society at the May meeting.

Dr. Casey Wood stopped for a few days in Chicago, before sailing for England the first week in June.

Dr. Will Walter had several of his golf playing friends to dinner at the Glen View Country Club during the American Medical Association meeting. A round of golf preceded the dinner.

Dr. Benjamin Franklin Baer, Jr., Associate Professor of Ophthalmology at the Graduate School of the University of Pennsylvania, has been appointed Visiting Surgeon to the Wills' Eye Hospital.

Dr. Leighton F. Appleman, Associate Professor of Ophthalmology in the Graduate School of the University of Pennsylvania, has been appointed Visiting Surgeon to the Wills' Eye Hospital to fill the vacancy made by the resignation of Dr. Thomas B. Holloway.

Dr. L. Webster Fox of Philadelphia and Mrs. Fox are spending two weeks in Santa Barbara, California, with their son Captain Lawrence Fox, Jr. From there they will go to Portland, Oregon, and on to Glacier Park, Montana.

Dr. Adolph Barkan, professor emeritus of ophthalmology of Stanford University, California, has been elected an honorary citizen of Ludwig-Maximillian University in Munich in recognition of his services in alleviating distress among students. Dr. Barkan, a Hungarian by birth, is a member of numerous scientific societies in Europe and America.

SOCIETIES.

The annual meeting of the American Ophthalmological Society was held at Hot Springs, Virginia, June sixteenth and eighteenth. Dr. Cassius D. Wescott, Chicago, was elected president; Dr. David Harrower, Worcester, Massachusetts, vice-president, and Dr. Thomas B. Holloway, Philadelphia, secretary-treasurer. The 1925 meeting will be held in Washington, D. C., May fifth and sixth.

There were more than four hundred and seventy registrants in the Section of Ophthalmology at the American Medical Association convention this year.

A large number of ophthalmologists took the examination of the American Board of Ophthalmic Examiners during the A. M. A. meeting. The material was provided by Dr. Suker of Chicago from patients in his service at the Cook County Hospital.

The visiting ophthalmologists were guests of the Chicago Ophthalmological Society, at a luncheon at the Drake Hotel on Wednesday. About two-hundred and fifty were present and, as it was a buffet affair, it proved a good opportunity for the members to get better acquainted with one another.

Dr. W. H. Wilder entertained sixty-five guests at a dinner at the University Club on Thursday evening. Brief after-dinner talks were made by Dr. White of Richmond, Virginia, who was the first Chairman of the Section, in 1885, and by a number of those who have held this position in succeeding years, including the present Chairman, Dr. Derby.

At the twelfth annual meeting of the Pacific Coast Oto-Ophthalmological Society, July 10-12, 1924, at Portland, Oregon, the following officers were elected: President, Dr. Henry M. Cunningham, Vancouver, B. C.; vice presidents, Drs. Clarence Benson Wood, Los Angeles, and Hans Barkan, San Francisco; secretary-treasurer, Dr. Walter F. Hoffman, Seattle. The next meeting will be held at Vancouver.

The Graduate Course in Ophthalmology and Oto-Laryngology, which was carried on in Denver from July twenty-first to August second, under the Colorado Ophthalmological Society and the Colorado Oto-Laryngological Society, was a more pronounced success than on any of the former occasions it has been given. Men from twenty-nine different states were in attendance. Some of the prominent men who gave lectures and demonstrations were: Dr. George E. de Schweinitz, Dr. Alexander Duane, Dr. H. W. Woodruff, Dr. M. Feingold, Dr. H. P. Mosher, Dr. Isaac Jones, Dr. L. W. Deane, and Dr. H. J. Prentiss.

MISCELLANEOUS.

By the will of Edward A. Larose, the Louisiana Commission for the Blind received $2,000.

About one-hundred and fifty-five cases of trachoma have been reported in a suburb of London known as Poplar.

The *School Magazine*, a Braille magazine for blind children, has been established in England. It contains essays, poetry, humor and a competition page.

Hair from an elephant's tail—ancient precaution against the evil eye—is said to be London's newest fad. Charms made from elephant's hair are sold in the forms of rings and bracelets.

A crusade to eliminate trachoma among the Indians of Arizona and New Mexico, was inaugurated July first under the direction of a special physician of the Indian office, assisted by surgeons of the U. S. Public Health Service. Temporary trachoma hospitals will be established in Indian school buildings unoccupied during the vacation period. Three operating units will be in the field, each headed by a special physician. This campaign grew out of the recent trip made by Secretary of the Interior, Dr. Hubert Work.

Current Literature

These are the titles of papers bearing on ophthalmology. They are given in English, some modified to indicate more clearly their subjects. They are grouped under appropriate heads, and in each group arranged alphabetically, usually by the author's name in **heavy-faced type.** The abbreviations mean: (Ill.) illustrated; (Pl.) plates; (Col Pl.) colored plates. Abst. shows it is an abstract of the original article. (Bibl.) means bibliography and (Dis.) discussion published with a paper. Under repeated titles are given additional references to papers already noticed. To secure early mention, copies of papers or reprints should be sent to American Journal of Ophthalmology, 217 Imperial Building, Denver, Colorado.

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